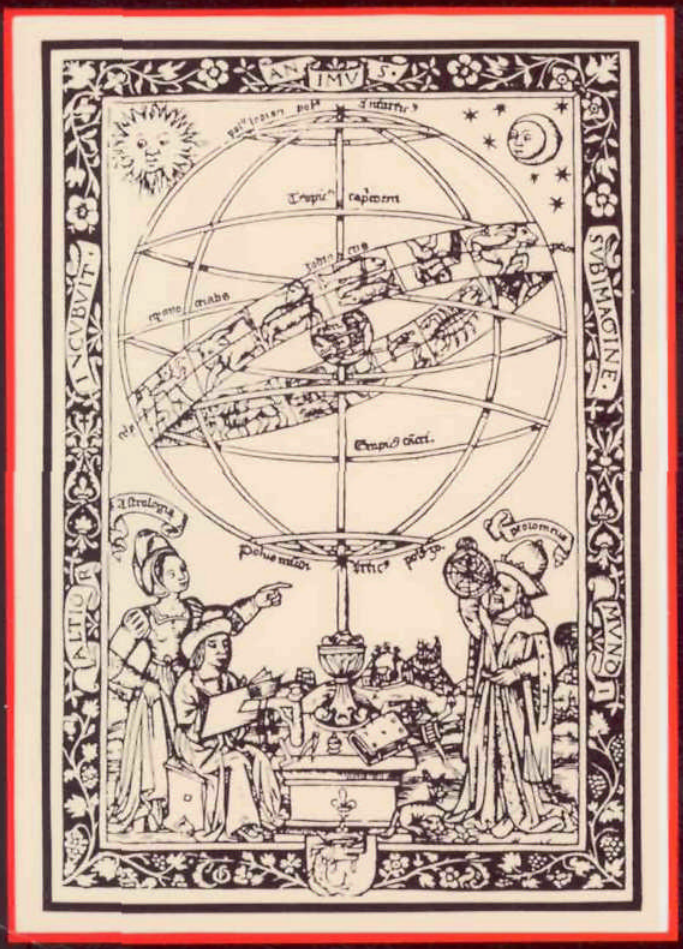
the Skeptical Inquirer

THE ZETETIC



Testing Astrology

Astronauts and UFOs / Sleight of Tongue / The Sirius "Mystery"

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

VOL. III NO. 1 FALL 1978

the Skeptical Inquirer

THE ZETETIC

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3 NEWS OF THE COMMITTEE

5 NEWS AND COMMENT

13 PSYCHIC VIBRATIONS

ARTICLES

17 An Empirical Test of Popular Astrology, *by Ralph W. Bastedo*

39 Astronaut "UFO" Sightings, *by James Oberg*

47 Sleight of Tongue, *by Ronald A. Schwartz*

56 Investigating the Sirius "Mystery," *by Ian Ridpath*

BOOK REVIEWS

63 Bernard Gittelson, *Biorhythm: A Personal Science* (James Randi)

68 Donald A. Hiatt, *True, False, or In Between: An Elective Course in Logical Thinking* (Lee Nisbet)

70 Random Bibliography (Robert R. Lockard)

73 FROM OUR READERS

77 CONTRIBUTORS

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News of the Committee

With this issue, the SKEPTICAL INQUIRER becomes a quarterly. Circulation is now approaching 3,000, and we are happy to report that the SKEPTICAL INQUIRER is being carefully read not only by professionals in the field and interested laymen but also by members of the media. The members of the Committee for the Scientific Investigation of Claims of the Paranormal are grateful for the past efforts of Marcello Truzzi—we wish him well in his new endeavor—and for the continuing efforts of our editor, Kendrick Frazier.

As readers of this journal know, this Committee has been concerned with developing balance in the media and has attempted to inform the public of dissenting scientific opinion concerning the paranormal. As part of this effort, the Committee lodged a complaint against the NBC network and affiliates for its broadcast of "Exploring the Unknown," a television "special" on psychic phenomena. I regret to report that the Federal Communications Commission has rendered a preliminary decision rejecting our complaint. The FCC maintains that:

> "Exploring the Unknown" did not constitute a discussion on one side of a controversial issue of public importance, [nor has NBC] failed on an overall basis to afford reasonable opportunities for the presentation of conflicting views regarding the matters raised . . .

But the Committee's attorney, David Lichtenstein, has appealed to the full commission, asking it to reconsider. In his appeal Mr. Lichtenstein stated:

> NBC should not be allowed to hide behind the fatuous assertion that their program was "entertainment." That the issue we raised was both controversial and of public importance can scarcely be challenged by anyone who even glances at the newspaper headlines . . .
>
> As to whether we present an issue of public importance . . . There are objective signposts. When thousands of teachers and parents are aroused about the spread of pseudoscience; when broadcasters can pervert their privilege in order to spread pseudoscience; when the American public spends billions of dollars to educate its youth in modern science and its methods, then the undermining of scientific method by purveyors of nonsense over the airwaves is a cause for serious concern.

We believe that the Committee has responded to the growing interest in the scientific community's making its views on pseudoscientific claims better known. In this regard, the Committee has contributed to the public's understanding of scientific methods.

I should point out, however, that the Fellows and the Scientific Consultants affiliated with this Committee, and our many supporters and friends who share our general skepticism, are surely not unanimous in viewpoint. Indeed, we have a wide range of views about many of the fields under investigation.

A good case in point is parapsychology. There are some Fellows and Scientific Consultants on our Committee who believe that it is *all* "balderdash" and that after decades of investigation nothing significant has been discovered. Other members of the Committee—including myself—believe that the field of parapsychology should be distinguished from the general area of "psychic claims." Although the results are inconclusive, some believe that there has at least been an effort on the part of some investigators of "psi phenomena" to use experimental methods. As I pointed out at the Smithsonian Institution in Washington, in a recent debate with Dr. J. B. Rhine—with some agreement from him—there have been efforts made by some parapsychologists to approach the subject matter carefully, yet at the same time other parapsychologists have engaged in careless investigations and made inflated claims. In any case, although the members of our Committee may differ about how to evaluate parapsychological research, we all are committed to the careful use of scientific methods and believe that the ultimate resolution must be based on the evidence.

One further point: Most members of the Committee believe that the negative case has not had a full hearing by the public. Nevertheless, most members have expressed an interest in working with anyone who is willing to present responsible claims for examination. For example, for two years several members have been working closely with Michel Gauquelin of Paris in an effort to test his hypothesis that there is a planetary influence on personality, in particular, a discernible "Mars effect" on sports champions. We expect to publish the results of their American study shortly. We have also extended invitations to researchers working in parapsychology, biorhythms, astrology, UFOlogy, and other areas. We reiterate that, though often skeptical, we nevertheless remain open to further cooperative work with those doing serious scientific research.

Paul Kurtz, Chairman

News and Comment

Berlitz's fictional "pyramid"

Charles Berlitz, author of *The Bermuda Triangle*, has for some time been claiming to have discovered an underwater pyramid in the "Bermuda Triangle," some 50 miles off the coast of southern Florida in the Bahamas. This supposed pyramid is claimed to be at least 420 feet high and 540 feet across at the base (although his statements vary), to be man-made, and to be a key to the alleged mysterious disappearances in the Bermuda Triangle.

In March 1978, Larry Kusche, author of *The Bermuda Triangle Mystery—Solved*, the book that has been acknowledged by the U.S. Coast Guard, Lloyd's of London, and many other authorities as the definitive work on the subject, challenged Berlitz to provide proof of his claim. Kusche showed in his book that Berlitz and others who have promulgated the legend of the Bermuda Triangle get many of the most elementary "facts" incorrect, make little or no effort to verify sources, ignore information that refutes their premises, and rarely, if ever, substantiate any claim or piece of information.

In the case of Berlitz's new pyramid claim, Kusche felt the burden of proof should be shifted: "The burden should, for a change, be on Mr. Berlitz to prove that what he says is true, not upon others to show where he has erred."

Before issuing his challenge, Kusche discussed the matter with oceanographers from the Massachusetts Institute of Technology, the Woods Hole Oceanographic Institution, the U.S. Navy, and several other organizations, and established several facts: (1) No such underwater pyramid has been found in previous sonar mappings of the area. (2) Pyramid-shaped sonar tracings like the one Berlitz presented as his sole "proof" are quite common but do not mean that pyramids exist on the ocean floor. (3) If such a thing as an underwater pyramid did exist, it would not be likely to give a pyramid shape on tracing paper because of the compressed horizontal scale used by the sonar equipment.

Because of Berlitz's lengthy record of consistent inaccuracy, Kusche felt that Berlitz should be encouraged to actually prove this claim and not merely use it for publicity—only to have it quietly shown to be wrong several months later, as has been the case with virtually all of his past revelations. Kusche made arrangements with the Berkshire County Savings Bank in Pittsfield, Massachusetts, to act as holder of a challenge account into which he and Berlitz would each deposit $10,000. The total account would be awarded to Berlitz if he was

NO PASSES OR BARGAIN MATINEE
CHARLES BERLITZ'S
THE BERMUDA TRIANGLE
Every year more and more people disappear forever into its depths. Find out why.
G
BASED ON THE BOOK BY CHARLES BERLITZ

Ad for movie version of Berlitz book, released to theaters in the summer of 1978.

able to prove to judges from such organizations as the Archaeological Institute of America, the Cousteau Society, the National Oceanic and Atmospheric Administration, the American Geophysical Union, the National Geographic Society, or any of several others, that the pyramid actually did exist. However, if Berlitz was unable to prove his claim by September 1, 1979, the award would be given to Kusche. In essence, Kusche was willing to give Berlitz $10,000 (and more important, to admit in public that Berlitz was correct) if Berlitz was merely able to prove that his word was good.

Kusche says that, since it was obvious the "pyramid" was only a publicity stunt, he did not expect Berlitz to even acknowledge the challenge. But, in fact, Berlitz did acknowledge it when, on April 24, 1978, seven days before the deadline, he informed a vice-president of the bank that he would not accept it.

The significance of the exchange is that Berlitz declined the challenge and therefore refused to bear the burden of proof to show that what he says is correct. Kusche feels that the point he was making has been substantiated: "Berlitz was not able to accept the challenge to prove the existence of the alleged pyramid because it is impossible to do so since there is no pyramid. Had Berlitz accepted the challenge, it would have publicly emphasized the fact that he is prone to making sensational, erroneous, unprovable statements. Berlitz has once again misled the public with false information that he will not and can not substantiate."

—K.F.

The Rorvik affair

The substantive aspects of the scientific controversy over David Rorvik's fiction-as-fact book, *In His Image: The Cloning of a Man*, do not really fall into the CSICP's domain.

Some members and readers disagree with that view, but the point is that the subject matter was straightforwardly scientific, and the probable invalidity of Rorvik's claim of a human clone was clearly and quickly pointed out by the scientific community and the scientific press. What does concern us is how such a sensational claim gets published as fact by a prominent publisher without apparently the slightest attempt to appraise its truthfulness. Here the subject has all too much in common with many sensational treatments in book form of supposed happenings on the paranormal fringes of science.

In this context it is worth noting a letter U.S. Congressman Paul G. Rogers of Florida sent to the Association of American Publishers following a hearing by his House Subcommittee on Health and the Environment that was prompted by Rorvik's book.

"I am somewhat surprised,"

Rogers wrote, as noted by Barbara Culliton in *Science*, "that the book publishing industry does not have some canon of ethics or at least guidelines. I am very concerned over the lack of responsibility on the part of the J. B. Lippincott Company . . . in publishing the Rorvik book as nonfiction. There are good reasons why books are categorized as fiction or non-fiction. If the public is to continue to have confidence in these designations, then the industry must insure that they indeed have meaning." (For an excellent and detailed critique of the Rorvik affair, see Culliton's devastating analysis in the July/Aug. 1978 *Columbia Journalism Review.*)

—*K.F.*

Bergen Evans (1904–1978)

Those who have tirelessly battled the current tide of nonsense are so few in number that the passing of anyone within their ranks constitutes a serious loss. We have now lost the man whose voice was perhaps the most eloquent, the most literate, ever raised in opposition to the intellectual *mal de siecle.* Bergen Evans, professor of English at Northwestern University for more than forty years, was a well-known celebrity from the early days of television as well as a noted man of letters. As host of such popular TV shows of the 1950s as "The Last Word" and "Down You Go," his wit was carried into millions of American homes. As the author of *A Dictionary of Contemporary American Usage* and other works, his reputation as a leading scholar of language and literature was firmly established.

But it was Evans's fervor in challenging popular myths that most clearly set him apart from his colleagues. In his popular book *The Natural History of Nonsense* (Knopf, 1946), Professor Evans debunked with style and substance such time-honored myths as: Negroes are evolutionarily situated between Caucasians and apes; corpses of murder victims exert some supernatural influence to trap their murderers; the mind has "nonmaterial" powers; animals can give us "premonitions" of impending death; and women sometimes give birth to a snake or an octopus. Professor Evans was never among those who would employ a cannon to shoot a mosquito: he would slice the mosquito cleanly in two with one masterful stroke of his razor-edged pen. Voltaire would have been envious of Evans's style. In *The Spoor of Spooks and Other Nonsense* (Knopf, 1954), we find one of the most masterful refutations of the ESP believers ever set in print. In this excerpt from a chapter titled "PSI-ing in the Carolinas," observe the inimitable Evans style:

> Dr. Rhine is fond of comparing himself with the great scientists of the past whose discoveries were at first greeted with scorn. But merely being laughed at doesn't make you right. *Their* demonstrations worked just as well in the presence of skeptics as believers. The solemnest ptolemist who ever feared a fact has to admit when once he puts his eye to a telescope, any telescope, anywhere, in anyone's presence, that—despite anathemas, Dominicans, doctors, dungeons, and edicts—Jupiter has the satellites that Galileo said it had. And it is just this sort of demonstration that those who believe in Psi won't—and can't—give . . . one does not jump overboard in mid-ocean merely because someone

says that someone else in whom he has the utmost confidence says that he just saw a sea-serpent off the port bow, not even if he insists that he saw it .23 beyond chance expectancy.

In this writer's one and only conversation with Bergen Evans, I asked him how he managed to accumulate all the nonsense he had written about. He replied, "You don't have to look for it. You just stand in one place, and it rolls all over you."

If only there were more like him.

—Robert Sheaffer

NASA's UFO constituency

In some manner or another—I'm really not sure how—my name was placed on a list NASA sends out to people who write in requesting UFO information. The list incorrectly identifies me as the chairman of the UFO Subcommittee of the CSICP. While I am a *member* of the subcommittee, our chairman in fact is Philip J. Klass, *Aviation Week* editor and author of *UFOs Explained.* I have not myself seen the list, although I understand that there are five organizations listed on it. Presumably the other four are NICAP, APRO, MUFON, and CUFOS, which are all composed primarily of dedicated UFO enthusiasts. To my knowledge this is the first time that the name of any noncredulous organization has been widely disseminated to the public as a source of information about UFOs, and hence the first time such a group has been able to get a clear picture of the types of letters that come in.

As it stands today, anyone who writes to NASA or the president for UFO information gets little more than a polite "thank you" and a list of five organizations to contact, including yours truly for the CSICP. And the letters *have* been arriving. The volume has not been heavy, and I have been able to reply with a few reprints of articles for very little cost. Only a small percentage of those interested in UFOs bother to write to the government for information. Presumably fewer still follow up on NASA's recommendations of where to write for additional information.

And who has been sending in all the letters? Children. Yes, it has been children, of elementary-school age. Only 13 percent of the letters I have received from NASA referral can be deduced to have originated from adults (while virtually 100 percent of my other UFO correspondence comes from adults). *A full 87 percent of the inquiries I have received are obviously written by young people, typically eleven or twelve years old.* Many of the letters state the age of the writer: "I am 12 years old and I am in sixth grade." But even where no age is stated, the distinguishing feature of these letters is that they are typically written on notebook paper, seldom on stationery or typed. In many cases, the paper was simply ripped out of a spiral-ring binder, the kind in widespread use in elementary schools. Some even rip the paper in half—why waste a perfectly good bottom half of paper when you didn't write anything on it? Most of these letters are handwritten, both envelope and letter, in an obviously youthful scrawl.

Here is what some of my correspondents have to say:

Dear Sirs, My name is ——— and I

am 11 years old. I am a firm believer in UFOs and wanted all possible info you could send. Thanks!

Dear Robert Sheaffer, I am 12 years old and I'm interested in UFOs. I wrote to the Government about UFO's and all they sent me was some coverup papers. My friends and I are interested in UFO's, but they aren't near as interested as I am. I'm doing a research on my own. Would you send me some information. Thanks.

Dear Chairman Sheaffer, I am interested in an U.F.O. Studies and ask you if you would send me a copy of Project Blue Book or some pieces and pictures of it. I wish to conduct an investigation on them.

Dear Hynek [*sic*], I am an 8th grader and I've been interested in UFO's, life on other planets and psychic powers. I buy UFO magazines every chance I get. . . .

Dear Sir: . . . I plan to work for NASA and I am very interested in U.F.O.'s.

Thus we have identified what appears to be the backbone of NASA's UFO constituency. They have not yet reached voting age. They scrawl half-legible notes of fifty words or less on a page torn from an elementary-school composition book. They represent 87 percent of NASA's UFO correspondence, if the sample I have received is in any way representative.

Was it for this constituency that the White House requested NASA to assume responsibility for all government UFO correspondence, and to reopen the question of whether a new government UFO investigation should be undertaken? In any case, it was to the clear displeasure of this constituency that NASA administrator Dr. Robert Frosch declined, replying to the White House that "because of the absence of (tangible or physical) evidence, we have not been able to devise a sound scientific procedure for investigating these phenomena." (See "NASA, the White House, and UFOs," by Philip J. Klass, in the Spring/Summer 1978 issue of the SKEPTICAL INQUIRER.

Had NASA complied with the president's request, perhaps it would have been for this ever-so-youthful constituency that a full-scale, taxpayer-supported UFO investigation would now be under way.

—Robert Sheaffer

Million-pound saucer hunt

If you feel dissatisfied with the *National Enquirer*'s million-dollar offer for proof that UFOs are extraterrestrial spacecraft, then try your luck instead with the U.K. Scotch Whisky company, Cutty Sark. Since July 1, 1978, Cutty Sark has offered one million pounds "for a device which can be proved to have been activated to arrive on earth from beyond our solar system." Presumably, a device intended to arrive on Mars that got here by mistake wouldn't qualify. But there's more yet. The company says: "Such a device must be *either* (*a*) a craft capable of interstellar travel which has transported extraterrestrial beings to earth, *or* (*b*) an unmanned reconnaissance vehicle, *or* (*c*) a missile, *or* (*d*) an artifact."

In announcing this offer, to a background of music from the Voyager space-probe record in the Star-

light cinema at the Mayfair Hotel, London, on June 1, Russ Taylor, director of Cutty Sark (U.K. Scotch Whisky) Ltd., said, "We feel strongly that insufficient interest is taken in certain aspects of aerial and extraterrestrial phenomena," leading several members of the audience to wonder where he had been for the past year. He added: "We are not interested in the cultist fringe, whatever their persuasion, who for reasons best known to themselves distort and confuse the UFO picture." (But, inevitably, it was the cultist fringe who were first to respond to the offer, though so far unsuccessfully.)

Taylor said he hoped that the prize would "stimulate high-level consideration, and appeal to the inspiration and imagination of a wide range of people throughout the world." Alien devices or artifacts submitted for the prize must be verified as of extraterrestrial origin by experts at the Science Museum, London. Alas, alien radio messages are specifically excluded from the offer—hard luck, NASA.

In addition, the company is offering three other prizes. These include £1,000 for a scientific paper judged to contribute most to our understanding of the UFO phenomenon and £ 500 for the best "UFO log"—information relating to aerial phenomena researched solely from the evidence contained in the logs of nineteenth-century sailing ships. Both these offers close on June 30, 1979 (the million-pound offer has no closing date). Also on offer are prizes to the value of £ 1,000 for the best ideas for items to be placed aboard a spacecraft like Voyager bound for the stars.

Hopeful entrants with pieces of flying saucer stored in their attics for just such an opportunity can get entry forms from Cutty Sark at 42 Albemarle Street, London W1X 3FE.

Meanwhile, Ladbroke's, the London bookmakers, are still offering odds of 40 to 1 that a UFO will land or crash on Earth with alien life aboard in a given 12-month period. Ruth Norman, of El Cajon, California, who claims to have been in touch with extraterrestrials, has so far staked several thousand pounds on this proposition.

—Ian Ridpath

CSICP section in Canada

Prompted by concern about uncontested claims of the paranormal in Canada, scientists there have formed a Canadian section of the Committee for the Scientific Investigation of Claims of the Paranormal.

In making the announcement on July 13, subcommittee organizers said: "The reason for forming such a committee in Canada is that we are concerned about the way in which the Canadian public is being bombarded with sensationalistic, one-sided reporting of alleged phenomena such as psychic surgery, ESP, UFOs, astrology, etc. We are concerned that the public is not being informed that these phenomena are *not* accepted as real or 'proven' by the scientific community at large; and while we do not seek to stifle interest in such things, we do want to see the public provided with the skeptical point of view so that they will at the very least be aware of the controversy that exists. In many cases the controversy is not within the scientific community, but rather between it and the proponents of the paranormal and occult, but this is by no means

always the case."

One particular subject of concern is unfounded claims of psychic surgery in the Philippines. Psychic surgery, promoted in a pseudo-documentary by NBC television last year, has also been a target of the parent CSICP group. The announcement pointed out that Canadians have provided one of the major sources of clientele for the psychic surgeons.

Another concern is the well-advertised exhibition, organized by the Smithsonian Institution's traveling exhibition service, at the Royal Ontario Museum (and at Concordia University in Montreal), on the history of research in the paranormal. "The display gave every indication that the existence of such phenomena was considered as a fact by the scientific community," complained subcommittee organizers James Alcock, Thomas Gray, and Henry Gordon. "In neither of these cases was any indication given that there is another point of view on the matter—a point of view which is probably the predominant one in the scientific world."

Alcock, a member of the CSICP, is a social psychologist at Glendon College, York University, in Toronto. Gray is an experimental psychologist at Concordia University in Montreal. Gordon is a mentalist-magician in Montreal.

Other members of the Canadian section are Pierre Berton, a Toronto author and broadcaster; Mario Bunge, philosopher of science at McGill University in Montreal; Paul Feldman of the Herzberg Institute of Astrophysics of Canada's National Research Council, Ottawa; Donald Hebb, McGill University psychologist (retired); and Leo Yaffe, chemist and vice principal, McGill University.

The Canadian subcommittee outlined its main goals as providing a source of critical expertise on the paranormal, providing controlled test conditions for the examination of persons who claim to be psychically gifted, protesting the media's "often one-sided sensationalistic reports" of supposed paranormal phenomena, and in general to act as a sort of "scientific consumers' group" concerning claims of the paranormal.

—*K.F.*

A welcome

The first issue of Marcello Truzzi's new publication on claims of the paranormal, the *Zetetic Scholar*, was published this summer. Truzzi, professor of sociology at Eastern Michigan University, was formerly associated with the CSICP as co-chairman and as editor of this journal, but left it last fall. There may well be confusion over the name, since THE SKEPTICAL INQUIRER was formerly known as *The Zetetic*. The rights to that name went with Truzzi when he left to establish his own independent publication.

The *Zetetic Scholar*, billed as an independent scientific review of claims of anomalies and the paranormal, will attempt, says its premiere editorial, "to create a continuing dialogue between proponents and critics of claims of the paranormal . . . we are interested not only in adjudication of the claims but with the sociology and psychology of the disputes themselves." Its list of consultants includes not only some prominent skeptics (including some members of the CSICP) but also several workers noted for contrasting views, such as J. Allen Hynek and

Charles Tart. The first issue contains articles on such subjects as "Skepticism, Science, and the Paranormal" and on the evaluation of the extraordinary, as well as useful bibliographies of literature on the paranormal.

We welcome the *Zetetic Scholar* and its complementary approach in dealing with the paranormal. For further information, write Marcello Truzzi, Department of Sociology, Eastern Michigan University, Ypsilanti, Michigan 48197.

—*K.F.*

Psychic Vibrations

Everyone has premonitions. If they occur frequently and accurately, the person is a "psychic." If you have long suspected that you may have psychic talents, the following provides the opportunity to evaluate your ability against those whom the *National Enquirer* calls "10 leading psychics," whose predictions of events that were to occur last year (1977) were published in the January 4, 1977, issue of that tabloid newspaper.

Listed below are a few of the events forecast to happen last year:

• "Barbara Walters will give up her television work and become a million-dollar-a-year lobbyist for a Mideast oil-producing company," predicted psychic Page Bryant.

• "Archeologists in Egypt will discover a spaceship that crashed in ancient times, proving once and for all that earth has been visited by beings from another planet," forecast psychic Micki Dahne.

• "Gerald Ford will start a new career as a sports director for a major university and will also be a guest TV sports commentator," according to "famed seer" Sybil Leek.

• "Frank Sinatra will step before the movie cameras once again, playing the President of the U.S. His portrayal will earn him an Oscar nomination," predicted Olof Jonsson, described as "the Chicago seer whose uncanny mental powers have helped him pinpoint sunken treasures." Jonsson also forecast that "the government will launch a probe following allegations that Jimmy Carter made shady financial deals, but he will be completely exonerated."

• "Freddie (Chico) Prinze will become the father of twins," forecast Jack Gillen. (Prinze committed suicide last year.) Another Gillen forecast: "Henry Fonda will become a hero when a plane he is on crashes during a landing on the West Coast."

• "Sen. Ted Kennedy and his wife Joan will be lost at sea for a time when their sailboat unexpectedly sinks. They will be adrift in a small lifeboat for several days before being rescued by fishermen," forecast psychic Shawn Robbins. She also predicted: "While making a speech in Chicago, Muhammad Ali will be shot at by a black militant but the assassination attempt will fail."

• "Ethel Kennedy will fall in love with Andy Williams and marry him this summer," forecast Hollywood psychic Kebrina Kinkade. She also forecast: "The Air Force will reveal it has captured an alien spacecraft and its humanlike occupants."

• "Peace will finally arrive in Northern Ireland after Pope Paul helps negotiate a settlement," forecast psychic Clarisa Bernhardt, who is

"recognized for her uncanny ability to predict earthquakes," the *National Enquirer* noted. In her field of specialization, Bernhardt predicted: "A series of earthquakes will strike throughout the world in October, with the biggest hitting China."

• "Pressure from angry parents will force Congress to change the busing laws," forecast Los Angeles psychic Florence Vaty.

If you too, in January, 1977, had premonitions of these events, then obviously you have strong psychic powers. If not, don't feel bad, for true psychic powers are rare.

* * * * *

The 1961 "UFO abduction" of Betty and Barney Hill is the classic example of a "close encounter of the third kind." Perhaps the most famous UFO case on record, it has been the subject of a best-selling book (*The Interrupted Journey*, by John G. Fuller), which was serialized in *Look* magazine, and in 1975 it became a made-for-TV movie on NBC ("The UFO Incident"), containing the usual number of inaccuracies and distortions that seem to characterize that network's reporting of the "paranormal." Now that Mrs. Hill is retired (her husband died in 1969), she divides her time equally between giving UFO lectures and watching UFOs land at the semi-secret "landing spot" she claims to have discovered in New Hampshire. While the reality of the Hill "UFO abduction" is an article of faith among UFO believers (despite CSICP Fellow Robert Sheaffer's refutation of the case, published in the August 1976 issue of *Official UFO*), Mrs. Hill's more recent claims are straining even the almost boundless credulity of the UFO groups. Mrs. Hill claims that the UFOs come in to land several times a week; they have become such a familiar sight that she is now calling them by name. Sometimes the aliens get out and do calisthenics before taking off again, she asserts. One UFO reportedly zapped a beam at her that was so powerful that it "blistered the paint on my car." Mrs. Hill also reports that window-peeping flying saucers sometimes fly from house to house late at night in New England, shine lights in the windows, and then move on when the occupants wake up and turn on the lights. Recently John Oswald, of Dr. J. Allen Hynek's Center for UFO Studies, accompanied Mrs. Hill on her thrice-weekly UFO vigil. Oswald, who is certainly no UFO debunker, reported: "Obviously Mrs. Hill isn't seeing eight UFOs a night. She is seeing things that are not UFOs and calling them UFOs." Mr. Oswald reports that during the vigil of April 15, 1977, Mrs. Hill was unable to "distinguish between a landed UFO and a streetlight." In view of these developments, does Oswald *still* believe that Barney and Betty Hill were really "abducted" by aliens in 1961? Absolutely. He explains, "We can't break the case or disprove it."

* * * * *

The impact of astronomer Charles Kowal's 1977 discovery of the mini-planet Chiron is spreading far beyond the realm of astronomy. Astrologers and UFOlogists as well are coming to appreciate its significance. A Canadian astrological publisher, Phenomena Publications, has recently compiled an astrological ephemeris for Chiron, to

enable astrologers to compute the influence Chiron supposedly exerts upon a client's horoscope. The obvious question to be answered is: If astrology is so "scientific," why did nobody notice the astrological effects of Chiron *before* that planet was discovered? In another exciting development, UFOlogist Wendell C. Stevens, writing in the May 1978 issue of *UFO Report*, contends that Kowal's discovery is far more revolutionary than anyone has yet supposed: it is nothing less than an extraterrestrial artifact of gargantuan dimension. "Fantastic as this seems," writes Stevens, "I believe Dr. Kowal has 'discovered' the alien star-base."

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While most scientists are still studying the causes for the two successive harsh winters to hit North America, researcher George Stone believes he has found the answer. Stone, who claims to be a geologist and a weather expert, and to have worked secretly with the CIA, says that the abnormally cold weather was probably caused by the Soviet Cosmos satellite which crashed early this year in northern Canada. "I feel that satellite may well have been controlling our weather all along the East Coast, and probably the other parts of the country," he told the tabloid *The Star*. "The satellite that crashed in Canada in January was in just the right position to control our weather all along the East Coast, where the snowstorms hit . . . I admit I have no hard evidence, but then there is no negative evidence either."

* * * * *

The ad, copyrighted by Columbia Pictures, provocatively asks, "If you wear a Close Encounter, will you have one?" And for a mere $16.95, you can find out, if you buy a "Close Encounters of the Third Kind Hologram." This is some sort of necklace, supporting a 3-D photo of the Close Encounters spaceman, his chandelierlike UFO, and Devil's Tower. Exactly how this cute little gimmick is supposed to attract UFOs is not clearly stated. Meanwhile, FASST—the Forum for the Advancement of Students in Science and Technology—reports that *Close Encounters* director Steven Spielberg has purchased cargo space from NASA on one of its first commercial launches of the Space Shuttle. Just what he plans to send up remains a mystery.

* * * * *

More astounding scientific discoveries from behind the Iron Curtain: the *Daily World*, newspaper of the Communist Party of the USA, reports that the state-operated transportation company in Bulgaria has initiated a pilot program to use biorhythms to decrease the number of traffic accidents involving truck drivers. "Now, before a long trip, each truck driver of International Transportation receives his personal 'biocard,' which notes the days on which that driver will be at his lowest working capacity." Can America ever hope to bridge the Pseudoscience Gap?

* * * * *

Back in 1950, theatrical writer Frank Scully brought out a sizzling little book titled *Behind the Flying Saucers*. It created a sensation because it

claimed, quoting one Silas Newton, who quotes one "Dr. Gee," that three flying saucers crashed in the deserts of the southwestern United States and that the government had recovered the bodies of thirty-four little men from Venus. Few people then took the story seriously, even UFO believers, especially when Newton and "Dr. Gee" were later arrested for peddling a worthless device that was supposed to detect oil deposits. But the rumor acquired a life of its own; and given the pronounced tendency toward ever-increasing credulity in the UFO movement, "scientific" UFOlogy has now reached the point where it is about to swallow, hook, line, and sinker, the yarn about little green men in pickle jars in the basement of the Pentagon. Leonard H. Stringfield is a pillar of the UFO establishment, serving on the board of directors of MUFON and as a field investigator for Dr. Hynek's CUFOS. Stringfield now claims: "On several occasions in the past 30 years UFOs have crashed and the bodies of dead entities have been taken from them. The bodies have been examined and preserved. My sources describe the beings as from three to four feet in height and of humanoid appearance." Stringfield adds cryptically that the aliens' "sex organs were very sensitive," but he refused to reveal how this fact was determined. During the spring of 1977, he says, there had been at least one Close Encounter of a Military Kind between the aliens and U.S. forces, with casualties on both sides. But there is one perplexing question Stringfield is unable to answer: How has the government, which was unable to keep such embarrassing and sensitive matters as Watergate and the Pentagon Papers under wraps for long, been able to keep the lid so tightly on a story like crashed flying saucers and Star Wars for more than 30 years? •

An Empirical Test of Popular Astrology

Ralph W. Bastedo

Introduction

Astrology is everywhere. It permeates contemporary American culture. Newspapers and magazines, ranging from the conservative *National Enquirer* to the radical *Berkeley Barb*, talk about it endlessly. Horoscopes are now carried by 1,250 daily newspapers, that is, by two out of every three papers in the United States. The average citizen can't help but be inundated by the flood of articles and syndicated columns.[1]

Such a state of affairs is amply borne out by recent Gallup polls. George Gallup reports that over three-quarters of American adults know their astrological sign. Furthermore, he finds that more than one adult in four embraces astrology. This means that there are between 30 and 40 million believers nationwide. So astrology has millions more followers than most religious denominations.[2]

The San Francisco Bay area, the focus of my study, is an astrologer's paradise. Telephone directories list thirty-four professional astrologers and astrological schools in the immediate vicinity of San Francisco and Berkeley. The vicinity also features eleven astrology shops and bookstores. Glock and Wuthnow of the Survey Research Center report that nine out of ten bay area residents know their sign—a saturation level rarely encountered in polling research. Only three out of ten bay area adults are firm disbelievers.

Bay area lifestyles reflect this. An ABC affiliate, KGO-TV, sponsors astrologer Joyce Jillson on its morning news and interview program "A.M. San Francisco." The Oakland Athletics, an American League baseball

team, employs astrologer Laurie Brady to consult with team players and help them throughout training. Students at U.C. Berkeley complain that bay area employers use an individual's astrological sign, deduced from one's birth date, to discriminate among job applicants. It's just too bad if you're Scorpio or Taurus—you won't get the job.

The Need for an Empirical Test

To counter astrology's evident popularity, nearly 200 scientists in 1975 signed a manifesto sponsored by *The Humanist* magazine deploring any recognition whatsoever of astrology as a science. The scientists described the astral art as characterized by "irrationalism" and "obscurantism." Included among the signers were 19 Nobel laureates.[3]

In response to the lament of the scientists, a San Francisco Bay area newspaper angrily cited arguments in defense of astrology. Its editors concluded by flinging down the gauntlet with a challenge: "With the availability of accurate measure of the universe and computers, the time to test astrology, including all its symbolism, has come."

I agree. Given the widespread popularity of astrology, a test of a few of its major tenets is certainly called for. An empirical testing of *all* facets of astrology would necessitate a lifetime of work and countless volumes of data and interpretation. That is not my goal. What I plan is considerably more modest. What I shall do is examine a few of the basic assumptions of popular astrology—that form of astrology in which over 30 million Americans believe.[4]

Popular Astrology and Judicial Prediction

I would describe popular astrology as a nontechnical and indiscriminate form of traditional, judicial astrology. It is judicial in that it attempts to foretell terrestrial life from the movements of celestial bodies. By contrast, natural astrology was used to foretell the movements of the heavenly bodies themselves. Natural astrology has quietly evolved into the science of astronomy and astrophysics.

Of the many, many types of judicial astrology that pertain to the "vitasphere," only a few directly relate to my testing. Of less concern to us are the ancient schools of (1) mundane astrology, (2) naturalist astrology, (3) agricultural astrology, and (4) astro-meteorology, or meteorological astrology. These attempt to forecast historical events and natural disasters of

worldly import. They try to predict wars, earthquakes, weather changes, plagues, assassinations, droughts, conspiracies, famines, and revolutions.

Of more direct interest to us are the schools of (5) genethliacal astrology, (6) electional astrology, and (7) horary astrology. These attempt to forecast human events in more personalized terms. They try to predict a wide array of human characteristics, particularly personality traits.

The discipline of genethliacal astrology is also called genethlialogy and natal horoscopy. Genethliacal astrologers construct and interpret personalized, lifelong horoscopes known as "natal charts." Estimates of an individual's destiny are computed on the basis of longitude, latitude, and precise time of birth.

The discipline of electional astrology is the horoscopic art of choosing exactly the right moment for a person to pursue an enterprise. Astrological "election" provides advice about when an individual should hold a wedding ceremony, assume public office, begin a voyage, or lay the foundation-stone for a new building.

The discipline of horary astrology answers questions for the individual as they crop up on a daily basis. Mass-circulation newspapers have popularized this version of the astral art. As any frequent reader knows, such "horoscopes" offer day-to-day advice based solely on a person's astrological sign at the moment of birth. This sign is also sometimes referred to as a "zodiac sign" or "sun sign."[5]

Popular Astrology and the Traditional Perspective

The assumptions of popular astrology remain faithful to astrological tradition. The public is not at all troubled by the "precession of the equinoxes," that very slow shift in the night sky pattern (as observed from earth) taking 25,800 years to come full circle. But the precession of the equinoxes does bitterly divide present-day astrologers.[6]

The division arises because traditional astrology, also described as the "movable" or "tropicalist" perspective, uses as its reference point the vernal equinox. The vernal equinox moves eastward 1.4 degrees each century through the "fixed" stars of the familiar zodiac constellations. Since a shift of about 30 degrees has transpired in the past 2,000 years, traditional astrology suffers from ossification. Because zodiac signs refer to 30-degree sectors of the ecliptic and not to constellations, the traditionalist's sign of Aries now coincides roughly with the real constellation of Pisces. Traditional astrology relies on the same model of the night-sky constellations as

recorded two millennia ago by ancient stargazers.

Popular Astrology vs. Technical Astrology

Yet while these issues of astrological calculation rage wildly amid astrologists, the public remains largely unaware or indifferent. The reason for this is quite understandable: popular astrology is not only both judicial and tradition-bound, it is also relatively nontechnical. Most Americans' interest in astrology focuses only on their particular constellation of the zodiac, or "sun sign." The sun sign is designated on the day of one's birth by the sun's position within a 16-degree-wide path of the ecliptic, a path otherwise known as the zodiac (hence the term "zodiac sign").

Full-time astrologers, concerned with the intricate calculations necessary for natal charts and other forecasts, go far beyond mere consideration of the sun sign. To some astrologists, it is of only secondary significance. Astrologers usually take into account the longitude, latitude, and precise moment of birth. They also calculate such relationships as the position of the sun and moon in regard to each of the eight planets and to the "ascendant"—the celestial "house" rising above the eastern horizon at the moment of birth.

The maze of calculations that professional astrologers make are far too complex to be adequately reviewed here. Suffice it to say that most folks are struck dumb by such measurements. They do not care for technical astrology with its calculations of "cusps," "medium coeli," "imum coeli," "angles," "transit," "aspects," "opposition," "conjunction," "sextile," "square," "trine," "quintile," "sesquiquadrate," "quincunx," and "orb." All they want to know is their sign.

And with good reason. Astrologists are in rare unanimous agreement that knowledge of the sun sign provides valuable, predictive information—albeit incomplete, perhaps—about human psychology and behavior. Astrologists may quibble over whether the sun sign reflects an "astral influence" or a biological process of "synchronicity," but they affirm in unison that the motions of the stars with regard to the earth correspond to an important array of deterministic influences upon human behavior.

The Birthday Sample

To find out whether people do, in fact, differ according to their sun sign,

it was necessary to locate a survey sample in which respondents had been asked their birth date. Knowing both the day and month of birth for each pollee would permit accurate division of the sample among the twelve zodiac signs.[7]

The sample adopted for this study was drawn in 1971 by the Survey Research Center of the University of California at Berkeley. The center sampled the San Francisco Bay area, a five-county region of 2.5 million people and one million households. The Berkeley researchers used a cross-sectional, stratified cluster sample. The response rate was 75 percent. Interviews were completed with 1,000 adults.

Although the survey data were collected admittedly for reasons

List 1
The zodiac typologies and cutting points as defined by this study

Zodiac sign	Ruler	Element	Cutting points
1. Aries the ram	Mars	Fire	March 22 to April 19
2. Taurus the bull	Venus	Earth	April 21 to May 20
3. Gemini the twins	Mercury	Air	May 23 to June 20
4. Cancer the crab	Moon	Water	June 23 to July 21
5. Leo the lion	Sun	Fire	July 24 to August 22
6. Virgo the virgin	Mercury	Earth	August 24 to September 22
7. Libra the balance or scales	Venus	Air	September 24 to October 21
8. Scorpio the scorpion	Mars or Pluto	Water	October 24 to November 21
9. Sagittarius the archer or centaur	Jupiter	Fire	November 23 to December 21
10. Capricorn the goat or sea-goat or goat-fish	Saturn	Earth	December 23 to January 19
11. Aquarius the water-bearer	Saturn or Uranus	Air	January 21 to February 17
12. Pisces the fish	Jupiter or Neptune	Water	February 20 to March 19

other than my test of popular astrology, they will serve our purpose quite well. This is because the questionnaire included a large number of items on which astrologists have made explicit predictions.[8]

The Zodiac Typology as Independent Variable

From our knowledge of respondents' birth dates it was possible to allocate the respondents among the twelve sun signs. There developed one small wrinkle, however. Because, while the sun changes signs around the twentieth of each month, the exact date on which it changes for any given month is not identical year in and year out. Nor, for that matter, do all astrologers agree on what the precise changeover dates should be. The result is muddied confusion for those few respondents who have the misfortune to be born around the twentieth of each month.

To eliminate this nuisance, specific cut-off points were adopted for each of the signs so the problematic cases could be dropped from tabulation. A review of astrological literature led to the decision to exclude those 45 respondents (out of the sample of 1,000) who were born on one of 18 problematic days.[9]

The exclusion of 18 days from the entire year of birthdays is no great loss. Almost 96 percent of our sample remains intact. This solution ensures that astrologists need not worry that our zodiac categories have been polluted by misclassified members of adjacent sun signs. The twelve-category zodiac typology created for our test is free of such contamination. See list 1 for a complete listing of the zodiac signs and corresponding cut-off points.

The Content Analysis

But one last barrier faces us before we can conduct our experiment. The problem arises that not all astrologers agree on which human characteristics are to be attributed to each of the twelve signs. Astrologers constantly wrangle over such matters. To choose the sun sign interpretations of only one astrologer would inevitably prompt accusations that our analysis was parochial, selective, and inconsequential.

So a different approach was adopted. It was decided to conduct a thorough "content analysis" of popularly available books dealing with traditional, judicial astrology. A total of fourteen sources, representing several schools of thought, were ultimately selected for the content

analysis. Most of the sources can be succinctly described as reviews by professional astrologers of prior and contemporary writings. All were obtained from public libraries.

From the content analysis of astrological literature a grand total of over 2,375 sign-specific adjectives were tabulated. From this statement it can be seen that each of the twelve zodiac signs was described roughly 200 times by assorted adjectives. About 30 adjectives were cited twice or more per sign. A little less than 100 adjectives on average were singularly mentioned. Despite this immense variety of words, the content analysis shows a remarkable degree of qualitative and substantive agreement among traditional exponents of judicial astrology. Most of the adjectives describing any one sign are either synonyms or terms sharing similar (albeit not equivalent) meanings. Antonyms are negligible.

The General and Specified Hypotheses

Two hypotheses will be tested. The first we shall label the "specified" or "specific" hypothesis. The second we shall christen the "general" or "generic" hypothesis. The specified hypothesis postulates a priori what impact each of the zodiac signs is to have upon human characteristics. This hypothesis therefore necessitates some sort of content analysis. But the generic hypothesis does not. It stipulates merely that human characteristics should differ according to sun sign. It does not postulate a priori in what direction or form these differences should be. It is non-specific.

Popular astrology will be vindicated if our data buttress the specified hypothesis. But if our evidence fortifies the generic hypothesis without lending support to the a priori specification, then popular astrology's vindication will be only partial.

Leadership Ability as the Dependent Variable

We find from the content analysis that leadership qualities are attributed to the zodiac signs of Leo, Aries, Scorpio, Capricorn, and Sagittarius. People born under these signs are predicted to be unusually strong, domineering, authoritative, masterful, tough, and kingly. They are born to be leaders.

Nonleadership traits are attributed to the signs of Taurus, Pisces, Cancer, and Virgo. People born under these signs are timid, insecure,

shy, clinging, indecisive, and weak. They are born to be servants.

Examining a cross-tabulation where sign is the independent variable and "leadership ability" is the dependent variable, we find what appears to be initial confirmation of the specified hypothesis. Refer to table 1. Aries illustrates a disproportionate amount of leadership ability within the top row of the table. But, sad to say, the signs of Leo, Scorpio, Capricorn, and Sagittarius do not. Indeed, all four are actually below rather than above the mean percentage of the row. As for our negative predictions, we find that both Virgo and Pisces are indeed above the average percentage of the bottom row. But Taurus and Cancer, alas, are not. This is bad news. Our cross-tabulation provides no decisive evidence to buttress the specified hypothesis regarding leadership ability.

To test the general hypothesis we use the chi-square (χ^2) goodness-of-fit statistic. Chi-square measures the discrepancy from the null hypothesis. The null hypothesis, or H_0, stipulates that the two variables being compared are statistically independent of one another, that there is absolutely no relationship whatsoever between the two. The chi-square statistic compares the cell frequencies observed within the rows and columns of the table with those predicted by the null hypothesis.

If the chi-square is quite large compared to the degrees of freedom, then the probability value and level of significance will be less than one percent.[10] The null hypothesis is then rejected. The observed relationship is judged statistically significant.

But if the chi-square is small relative to the degrees of freedom, then the probability value and corresponding level of significance will be much greater than this percent. In that case, H_0 is accepted and the generic hypothesis is weakened. The observed relationship is deemed statistically insignificant. It is attributed to chance fluctuation.

For this particular cross-tabulation the chi-square statistic is relatively small. The relationships observed are not significant at even the .05 level. The distributions we see may be safely attributed to random chance. The data here fail to strengthen the generic hypothesis.[11]

Political Stand as the Dependent Variable

The content analysis tells us that liberalism is associated with the sun signs of Aquarius, Aries, Gemini, and Sagittarius. Folks born under these signs are forecast as distinctly unconventional, rebellious, impatient, reformist, mutable, revolutionary, radical, rash, and liberal. They

Table 1

Cross-tabulation with astrological sign as the independent variable and "leadership ability" as the dependent variable

"This question concerns various talents and characteristics. Please indicate whether you think you have a lot, a fair amount, only a little, or none at all by circling the appropriate number next to each item:

Leadership ability (1) a lot, (2) fair amount, (3) only a little, or (4) none at all."

The a priori predictions of leadership qualities are capitalized.
The a priori predictions of servile qualities are in italics.

	ARIES	*Taurus*	Gemini	*Cancer*	LEO	*Virgo*	Libra	SCORPIO	SAGITTARIUS	CAPRICORN	Aquarius	*Pisces*	total
1)	34%	19%	13%	25%	18%	19%	26%	18%	20%	17%	16%	26%	21%
2)	39	54	60	48	51	51	40	52	48	50	53	32	48
3)	17	20	17	20	25	19	24	16	24	22	17	29	21
4)	10	8	11	7	6	11	11	14	8	11	15	13	10
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	79	81	88	90	76	77	79	88	76	84	953

degrees of freedom = 33.0 chi-square = 38.012 probability value = 0.25

are born to be leftists.

Conservative traits, on the other hand, are attributed to the signs of Taurus, Cancer, Leo, Virgo, and Capricorn. Such individuals are patient, traditional, cautious, conventional, tenacious, obstinate, persistent, and conservative. They are born to be rightists.

Looking at the cross-tabulation with zodiac sign as the independent variable and "stand politically on most issues" as the dependent variable, we find again what appears to be initial confirmation of the specific hypothesis. Refer to table 2. Aquarius, as predicted, is more liberal than average for the first and second rows. But Sagittarius, Aries, and Gemini are not. Overall, they are actually less liberal. As for the conservative predictions, we see that Virgo has easily the largest percentage for the bottom three rows. This makes it the most conservative of the signs. The figures for Capricorn are likewise greater than the typical percentages for these rows. Yet Taurus and Cancer are smaller than average. This will not do. The cross-tabulation presents no conclusive evidence to buttress the specified hypothesis regarding political stand.

To test the generic hypothesis we use the chi-square goodness-of-fit statistic. We see that for this cross-tabulation the chi-square is relatively tiny. Since the probability value is much larger than .05, the associations seen within the table are statistically insignificant. The frequencies we have observed can be attributed to chance fluctuation. The data fail to strengthen the generic hypothesis.[12]

Subjective Intelligence as the Dependent Variable

We learn from the content analysis that intellectual abilities are associated with the zodiac signs of Aquarius, Sagittarius, Aries, Gemini, and Virgo. Persons born under these signs are predicted to be exceedingly analytical, rational, logical, educated, intelligent, scientific, discriminating, ingenious, and intellectual. They are born to be academicians. Anti-intellectual qualities, on the other hand, could not be derived from the content analysis. It appears that none of the twelve signs is characterized by stupidity.

Taking a close look at the cross-tabulation with sign as the independent variable and subjective "intelligence" as the dependent variable, we discover that Aquarius and Sagittarius lend support to the specified hypothesis. As predicted, Aquarius and Sagittarius both are more intelligent than average within the uppermost row. Note table 3. But

Table 2

Cross-tabulation with astrological sign as the independent variable and "stand politically on most issues" as the dependent variable

"Suppose that the line drawn . . . shows the range of political opinion in our country. Where would you say you stand politically on most issues?

(1) radical, (2) radical/liberal, (3) liberal, (4) liberal/moderate, (5) moderate, (6) moderate/conservative, (7) conservative, (8) conservative/very conservative, or (9) very conservative."

The a priori predictions of liberal qualities are capitalized. The a priori predictions of conservative qualities are in italics.

	ARIES	*Taurus*	GEMINI	*Cancer*	*Leo*	*Virgo*	Libra	Scorpio	SAGITTARIUS	*Capricorn*	AQUARIUS	Pisces	total
1)	1%	3%	4%	8%	4%	5%	7%	3%	4%	6%	7%	4%	5%
2)	7	5	5	9	6	2	4	8	5	7	11	5	6
3)	12	16	24	22	23	23	18	24	22	14	18	21	20
4)	9	8	16	6	13	12	11	10	15	14	14	15	12
5)	42	43	29	41	33	25	38	26	31	37	34	29	34
6)	9	16	12	6	9	9	8	8	4	5	5	8	8
7)	20	8	9	5	11	21	11	15	13	15	10	15	13
8)	0	0	1	3	0	1	3	0	4	1	1	2	1
9)	0	2	0	1	2	2	1	7	3	2	1	2	2
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	69	63	76	79	86	87	76	74	78	87	74	83	932

degrees of freedom = 88.0 chi-square = 84.274 probability value = greater than 0.25

Table 3

Cross-tabulation with astrological sign as the independent variable and subjective "intelligence" as the dependent variable

"This question concerns various talents and characteristics. Please indicate whether you think you have a lot, a fair amount, only a little, or none at all by circling the appropriate number next to each item:
Intelligence (1) a lot, (2) fair amount, (3) only a little, or (4) none at all."

The a priori predictions of intelligence are capitalized.

	ARIES	Taurus	GEMINI	Cancer	Leo	VIRGO	Libra	Scorpio	SAGITTARIUS	Capricorn	AQUARIUS	Pisces	total
1)	27%	22%	22%	26%	21%	23%	29%	33%	28%	25%	28%	23%	25%
2)	67	75	73	70	74	67	62	61	68	72	62	66	68
3)	6	3	5	3	6	9	9	7	3	3	11	8	6
4)	0	0	0	1	0	1	0	0	1	0	0	4	1
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	78	81	88	90	76	77	79	88	76	84	952

degrees of freedom = 33.0 chi-square = 35.371 probability value = 0.35

Gemini, Aries, and Virgo, alas, have percentages lower than average. This is quite unsatisfactory. Our cross-tabulation provides no conclusive evidence to support the specific hypothesis of subjective intelligence.[13]

To examine the generic hypothesis we apply the chi-square goodness-of-fit statistic. It appears that for this cross-tabulation also the chi-square is relatively small. The relationships we see in the table are not statistically significant at the .05 level. The cell frequencies we have observed should be attributed to random chance. The data do not strengthen the general hypothesis.[14]

Ascribed Intelligence as the Dependent Variable

Astrologists might contend that the previous test suffers from a reliance on subjective estimation by the respondent himself, that it does not rely on a more objective, outside appraisal. Luckily for our experimental design, a second item on the questionnaire asked the interviewer to judge the intelligence of the pollee as conveyed during the hour or two of questioning. Using the same derivations from the content analysis as earlier, we now have a second table against which to check our earlier predictions.

Examining the cross-tabulation with sun sign as the independent variable and "intelligence quotient" as the dependent variable, we discover that Sagittarius once again lends credence to the specified hypothesis. As predicted, Sagittarius is more intelligent than average within the top row. But our prediction this time is even further off the mark than on the last occasion. Aries, Gemini, Virgo, and Aquarius have fewer intelligent people than average. If these particular zodiac signs really do indicate intelligence, one might conclude that their members cleverly hide it from both themselves and others. They may indeed be intelligent, but neither they nor anybody else apparently realize it. Suffice it to say that such an empirical result, however explained, is unsatisfactory. Our cross-tabulation undermines the specified hypothesis regarding ascribed intelligence. Examine table 4.

Once again we apply the chi-square goodness-of-fit statistic to test the general hypothesis. But the chi-square is too little. The relationships observed within the cells of the table are not significant at even the .05 level. The frequencies we have observed can be attributed to chance fluctuation. For the fourth time the data weaken the generic hypothesis.[15]

Table 4

Cross-tabulation with astrological sign as the independent variable and ascribed "intelligence quotient" as the dependent variable

"How would you rate the respondent's I.Q.?

(1) far above average, (2) somewhat above average, (3) about average, (4) somewhat below average, (5) far below average."

The a priori predictions of intelligence are capitalized.

	ARIES	Taurus	GEMINI	Cancer	Leo	VIRGO	Libra	Scorpio	SAGITTARIUS	Capricorn	AQUARIUS	Pisces	total
1)	6%	15%	8%	8%	10%	7%	9%	7%	11%	8%	8%	12%	9%
2)	50	28	43	40	40	43	40	47	33	41	41	39	40
3)	43	52	44	45	42	49	46	38	48	38	50	44	45
4)	1	5	5	6	6	1	3	8	8	13	1	2	5
5)	0	0	0	1	1	0	3	1	0	1	0	2	1
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	77	80	87	89	76	77	79	88	76	82	946

degrees of freedom = 44.0 chi-square = 48.199 probability value = 0.31

Astrological Belief as the Dependent Variable

If people with ordinary senses are consistently unable to detect their own true traits—as some astrologists might indeed surmise from our evidence—then perhaps at least the sensually gifted will differ. We can hope that people with occultist and similar extrasensory abilities will be able to divine the truth on such matters.

From the content analysis we find that occultist qualities are attributed to the sun signs of Pisces, Scorpio, and Aries. People born under these signs are predicted as unusually clairvoyant, shrewd, mystical, magical, spiritual, psychic, and occultist. They are born to be astrologers. Anti-occultist properties could not be derived from the content analysis. It would appear that the occult has only friends, and no enemies, among the twelve zodiac signs.

Examining the cross-tabulation with sign as the independent variable and "belief in astrology" as the dependent variable, we find what looks like initial confirmation of the specified hypothesis. See table 5. Pisces and Aries display higher percentages of astrology-prone belief than the overall mean of the top and second rows. But Scorpio, alas, displays a lower percentage. This is tragic. It sure beats me why so, so many people with occultist insight should disbelieve in astrology. Once again, it must be noted, the inconsistency within the cross-tabulation undermines the specific hypothesis.

To test the generic hypothesis we use the chi-square goodness-of-fit statistic. Our chi-square here is relatively small. The relationships seen in the table are not at the .05 level of significance. The distributions within the cross-tabulation should be attributed to random choice. The data once again, for the fifth time, undermine the generic hypothesis.[16]

The Twenty-eight Additional Variables

To supplement the five dependent variables already cited, twenty-eight additional items were run and then examined for statistically significant results. Nine of these additional items tap other personality traits. The nine are subjective measurements of one's (1) music ability, (2) artistic ability, (3) ability to make friends, (4) ability to organize well, (5) ability to feel deeply, (6) ability to make things, (7) self-confidence, (8) creativity, and (9) gift of gab.

Six additional questionnaire items tap feelings toward the occult.

Table 5

Cross-tabulation with astrological sign as the independent variable and "belief in astrology" as the dependent variable

"People who believe in astrology claim that the stars, the planets, and our birthdays have a lot to do with our destiny in life. What do you think about this:

Are you (1) a firm believer in astrology, are you (2) somewhat doubtful, are you (3) very doubtful, or are you (4) a firm disbeliever?"

The a priori predictions of occultist abilities are capitalized.

	ARIES	Taurus	Gemini	Cancer	Leo	Virgo	Libra	SCORPIO	Sagittarius	Capricorn	Aquarius	PISCES	total
1)	9%	5%	6%	14%	9%	9%	13%	9%	6%	8%	8%	10%	9%
2)	46	45	44	30	47	37	39	39	36	33	45	51	41
3)	28	19	22	20	25	18	20	26	24	26	23	16	22
4)	18	32	28	37	19	37	29	26	33	33	24	24	28
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	68	65	79	81	88	90	77	77	78	88	74	83	948

degrees of freedom = 33.0 chi-square = 33.043 probability value = 0.47

The six are subjective measurements and evaluations of one's (10) knowledge about astrology, (11) knowledge about horoscopes, (12) knowledge about one's own astrological sign, (13) interest in one's horoscope, (14) experience with extrasensory perception, and (15) type of ESP experience.

Four items tap the respondent's social philosophy and outlook on life. Three measured the degree to which the pollee felt that (16) most of life is decided for us rather than by us, that (17) some people are born lucky and others are born unlucky, and that (18) people suffer because they haven't learned to find inner peace. The fourth (19) recorded the respondent's view of the purpose of life.

Three items tap sociological characteristics. The three are categorical variables describing the subject's (20) occupation, (21) religion, and, if Protestant, (22) denomination.

Lastly, five items describe the respondent's physical appearance. Four were judgments by the interviewer of the respondent's (23) attractiveness, (24) physical disabilities, (25) height, and (26) weight. The fifth (27) was a subjective evaluation of one's good looks.

None of these twenty-seven supplemental variables yielded results that were statistically or substantively noteworthy.[17] No support was found for either (a) the general hypothesis or (b) the specified hypothesis within any of the twenty-seven supplemental cross-tabulations.

But since astrological prediction depends so much on the date of birth, it was suggested that age in years be used as a control variable. Although neither technical astrology nor popular astrology presupposes any zodiac irregularities according to age, this seemed a reasonable request given the time-dependent nature of the astral art. Running chi-square for each of the five original and twenty-seven supplemental variables while controlling for age again produced statistically uninteresting results. The sixty-two partial tables created in this endeavor yielded no surprises.

Conclusions

Popular astrology is clearly rooted in traditional, judicial astrology. It should not be confused, however, with the technical astrology of some proponents of the astral art.

Our empirical test of popular astrology confirms neither (*a*) the general hypothesis nor (*b*) the specified hypothesis of astrological predic-

tion. The test sustains the null hypothesis.

The impotence of the general hypothesis was repeatedly documented by the chi-square goodness-of-fit statistic. An examination of thirty-three variables, measuring everything from physical attractiveness to belief in astrology, found no variable that was statistically significant at the .01 level when cross-tabulated with the astrological sign of the respondent. Indeed, thirty-two of the thirty-three were not significant at even the .05 level, an outcome fully in accord with probability theory. All of our results can be attributed to random chance.

An intensive look at five dependent variables for which content analysis permitted detailed a priori prediction found the specified hypothesis to be lacking in every instance. The null hypothesis was sustained in each of the cases. The five measured (1) leadership ability, (2) political stand, (3) subjective intelligence, (4) ascribed intelligence, and (5) astrological belief.

From such results one can only conclude that quite a number of the tenets of popular astrology are untenable.

To the good-humored scientist and layman alike, I wish to end with a note that my test has been thoroughly scientific. My dispassionate approach has been broad-minded, detached, unprejudiced, and unbiased. The methods I have used have been logical, rational, and trust-inspiring. I have incorporated my natural intelligence, genius, brilliance, and inventiveness in this truth-thirsting endeavor. Above all else, I have remained sincere, honest, idealistic, and serious in my never-ending quest for the truth.

It could not be otherwise. Because I am an Aquarian. And Aquarians are like that.

Acknowledgment: My thanks for their assistance goes to Ann Stannard, Dennis Rawlins, Persi Diaconis, and especially Charles Y. Glock.

Notes

1. The best-selling astrological periodical in the nation is *Horoscope*, published by Dell. *Horoscope* has a monthly circulation of a quarter-million, a readership many times larger than that of most astronomy and general science publications. Even so prestigious a group as the 6,000-member Association for Humanistic Psychology, publisher of the *Journal of Humanistic Psychology*, has flirted with the subject. Instruction in "Experiential Astrology" was sponsored by the AHP at its latest national convention.

2. According to Gallup, believers in astrology tend to be much less educated, without a higher-status job, nonwhite, poor, under 25 years old, single, and female. Studies of public opinion in foreign lands yield similar findings. They confirm the existence of millions of

believers in Australia, Brazil, France, Great Britain, India, Japan, and West Germany.

3. The manifesto, its signers, and their criticisms are cited by Bart J. Bok and Lawrence E. Jerome (eds.) in *Objections to Astrology* (Buffalo, New York: Prometheus Books, 1975).

4. I am treading in the footsteps of P. R. Farnsworth, J. A. Hynek, A. Müller, B. I. Silverman, M. Whitmar, and A. Standen. I shall try to avoid the pitfalls into which P. Choisnard, K. E. Krafft, C. G. Jung, R. J. Pellegrini, and M. Gauquelin have fallen.

5. A good review of these and related subjects is given by Louis MacNeice in *Astrology* (Garden City, N.Y.: Doubleday, 1964), pp. 8-35.

6. The point of their disagreement is over how to handle the "synetic vernal point," that is, the degree and constellation in which the rising sun is located on the first day of spring (the vernal equinox, about March 21). Sidereal astrology, also known as the "fixed" perspective, argues that by using zero degrees Aries the traditionalists are two millennia out of date. The siderealists claim that the traditionalists have neglected to compensate for the movement of the earth's axis relative to the stars.

7. This method is much better than asking subjects what their signs are, since all too often they give wrong answers. For instance, within this particular sample, more than one person in twenty gave an incorrect sign. Moreover, one person in ten could not give any answer. Experimenters far too often neglect this problem.

8. As an aside, it should be noted that the researchers purposely overselected for young adults 30 years old and below. Respondents born between 1942 and 1957 numbered 565. Those born between 1880 and 1942 numbered just 435. A proportionately representative sample would have had 328 respondents 30 years old and under and 672 respondents over age 30. We shall examine the sample in its unweighted form to avoid any charge of unfair manipulation of the data. Although neither popular astrology nor technical astrology presuppose any zodiac irregularities according to age groups, we shall adopt age as a control variable later in our analysis to allay fears of a hidden distorter effect.

9. The excluded birthdates are April 20, May 21 and 22, June 21 and 22, July 22 and 23, August 23, September 23, October 22 and 23, November 22, December 22, January 20, February 18 and 19, and March 20 and 21.

10. The degrees of freedom is the product of (*a*) the number of rows minus one and (*b*) the number of columns minus one. It is usually expressed as $(r-1)\,(c-1)$.

11. This finding parallels one test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns, eliminating those three zodiac signs for which predictions were lacking. With 1.0 degrees of freedom and a chi-square of 0.135, the probability value was .72.

12. This finding parallels a test of significance for the specified hypothesis. The test was done by collapsing the table into two rows and two columns, eliminating those three signs for which predictions were absent. With 1.0 degrees of freedom and a chi-square of 0.400, the probability value was .53.

13. The cross-tabulation, however, does suggest why unintelligent qualities could not be derived from the content analysis. It would appear that stupidity is an amazingly rare trait—at least according to subjective estimates.

14. This finding parallels a test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 0.017, the probability value was .89.

15. This finding also parallels a test of significance for the specific hypothesis. The test was run by collapsing the table into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 0.017, the probability was .89.

16. This finding, too, parallels a test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 2.903, the probability value is .09 (the best probvalue we have yet had, but still lacking statistical significance).

17. None of the 27 supplemental variables were significant at the .01 level. Indeed, 26 of the 27 were not significant at even the .05 level. Such results are in accord with probability theory. Needless to say, none of the 27 tables bore a relationship in harmony with the

predictions of astrologers.

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Astronaut "UFO" Sightings

James Oberg

The glamour and drama of manned space-flights has been transferred to the UFO field via a highly publicized group of "UFO sightings" and photographs allegedly made by American and Russian space-pilots. Hardly a UFO book or movie fails to mention that "astronauts have seen UFOs too."

Careful examination of each and every one of these stories (and they total more than 20 or 30) can produce quite reasonable explanations, in terms of visual phenomena associated with space flights. On a visit to the NASA Johnson Space Center in Houston in July 1976, Dr. J. Allen Hynek, of the Center for UFO Studies, concluded that none of the authentic cases (as opposed to the majority of reports, which are fictitious) really had anything to do with the "real UFO phenomenon."

Skeptical investigators, while pleased that Hynek had dismissed all "astronaut UFO reports" as unreliable, have insisted that this body of stories has quite a lot to do with the major problems besetting the UFO community. How, they ask, can a body of stories so patently false and unreliable obtain such seeming authenticity simply by being passed back and forth among researchers without ever being seriously investigated? Is this a characteristic of UFO stories in general; and if so, the skeptics ask, can a study of how the "astronaut UFO" myth began and flourished help us to understand better the UFO phenomenon in general?

Hynek's disavowal of the stories came after his book *Edge of Reality* (coauthored with Jacques Vallee) carried a long list of astronaut sighting reports. Hynek told colleagues that the inclusion of the list (compiled by George Fawcett) in the book was Vallee's idea, not his, but that even

so he just wanted to generate interest and discussion. He insisted that inclusion of the list was not a judgment on his belief in its credibility and that readers had no right assuming that the data had actually been verified just because they were included in his book. Fawcett, on the other hand, claims that he just assembled the list from all available sources and assumed that somebody *else* would check the accounts before publication. "Maybe 1 percent of the stories are *true* UFOs," Fawcett suggested in 1978.

This is the complete "Fawcett List" as printed in *Edge of Reality.* Following each incident, we supply, in italics, the most likely explanation of the report.

February 20, 1962—John Glenn, piloting his Mercury capsule, saw three objects follow him and then overtake him at varying speeds. *Glenn also said that these "snowflakes" were small, and seemed to be coming from the rear end of his capsule. Later flights also observed them and were able to create "snowstorms" by having astronauts bang on the walls of their capsules. Verdict: Significant data was withheld, totally altering the nature of the incident.*

May 24, 1962—Mercury 7: Scott Carpenter reported photographing fireflylike objects with a hand camera and that he had what looked like a good shot of a saucer. *Carpenter did see "fireflies," as well as a balloon ejected from his capsule. The claim that he reported photographing a "saucer" is counterfeit. His photo, taking into account the glare of sunlight, smeared window, and gross enlargement of the small image, has been widely published as a "saucer" but was in fact the tracking balloon.*

May 30, 1962—X15 pilot Joe Walton photographed five disclike objects. *This story appears to be a complete fabrication. The real pilot's name was Joe Walker.*

July 17, 1962—X15 Pilot Robert White photographed objects about 30 feet away from his craft while about 58 miles up. *Right—and as he reported, the objects were small, "about the size of a piece of paper," and were probably flakes of ice off the super-cold fuel tanks. Verdict: Important information withheld by authors.*

May 16, 1963—Mercury 9: Gordon Cooper reported a greenish UFO with a red tail during his fifteenth orbit. He also reported other mysterious sightings over South America and Australia. The object he sighted over Perth, Australia, was caught on screens by ground tracking stations. *Cooper has recently denounced all stories of UFOs on his space*

flights as fabrications. The multicolor UFO is based on a deliberate misquotation by an author of Cooper's postflight report on a sighting of the Aurora Australis. Verdict: Fraud.

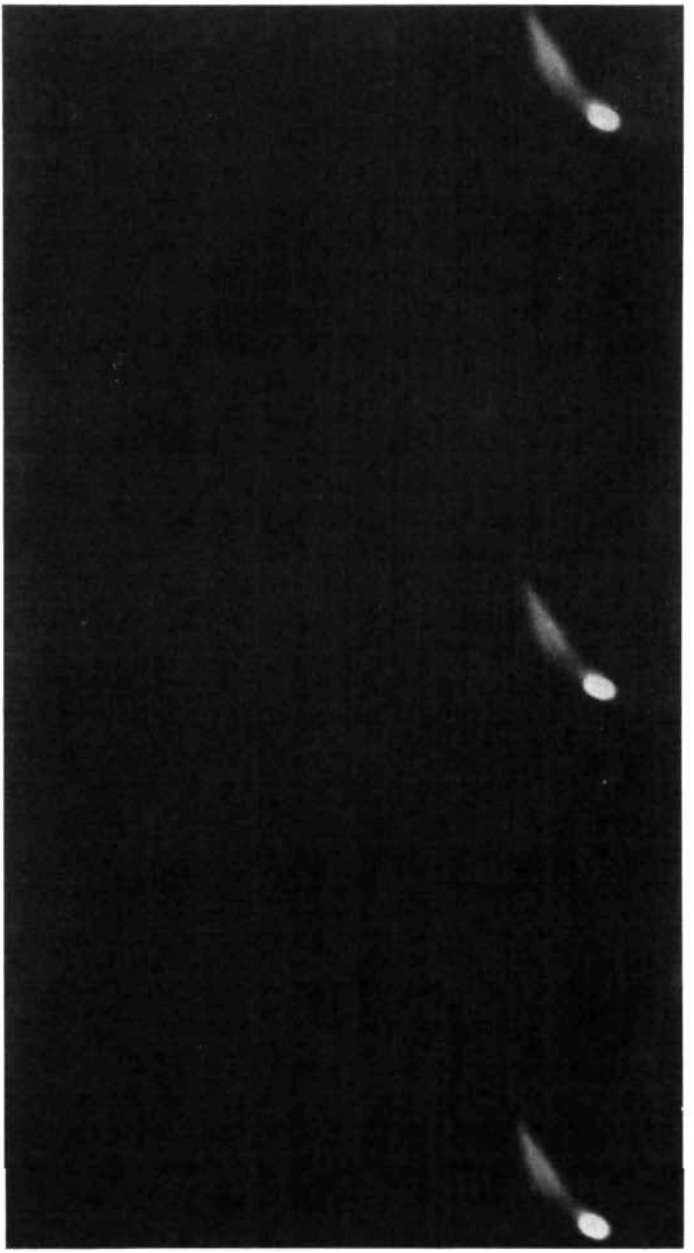
October 3, 1963—Mercury 8: Walter Schirra reported large glowing masses over the Indian Ocean. *Indeed he did, referring to lightning-lit cloud masses over the ocean a hundred miles below. The author of this story deliberately quoted out of context. Verdict: Fraud. And note: Wrong date (really 1962), and Mercury 8* follows *Mercury 9 in this "reliable" chronology.*

March 8, 1964—Voskhod 2: Russian cosmonauts reported an unidentified object just as they entered the earth's atmosphere. *Several* hours *before returning to earth the cosmonauts spotted a cylinder-shaped object they assumed (probably correctly) was just another man-made satellite. Such sightings were becoming more and more frequent as the number of manned flights and unmanned satellites rose.*

June 3, 1964—Gemini 4: Jim McDivitt reported he photographed several strange objects, including a cylindrical object with arms sticking out and an egg-shaped UFO with some sort of exhaust. *This is the most famous "astronaut UFO" case, and it has been embellished and distorted in dozens of publications. McDivitt saw a "beer-can shaped" object which he took to be another man-made satellite (some observers believe it was his own booster rocket), and tried to take a few photos which did not turn out. A still from the movie camera (which McDivitt insists he never touched during the sighting) was mistakenly released without the astronaut's review, showing what turned out to be a light reflection off his co-pilot's window, according to McDivitt. UFO buffs took this photo and acclaimed it as one of the best UFO photos ever taken, showing (they claim) a glowing object with a plasma tail. McDivitt never saw anything like that in space. Verdict: Gross exaggeration and distortion on the part of UFO writers. Also, the year is wrong—it should be 1965.*

October 12, 1964—Voskhod 1: Three Russian cosmonauts reported they were surrounded by a formation of swiftly moving disc-shaped objects. *This story appears to be a complete fabrication, but UFO buffs cling to it while challenging skeptics to "prove it did* not *happen."*

December 4, 1965—Gemini 7: Frank Borman and Jim Lovell photographed twin oval-shaped UFOs with glowing undersides. *This famous photograph is a blatant forgery, in which light reflections off the nose of the spacecraft are made to look like UFOs by airbrushing away the vehicle structure around them. Verdict: Fraud.*



Famous McDivitt "UFO" photo (actually a still movie film), which has been reprinted in dozens of UFO books and magazines, is only a reflection of the sun on co-pilot's window, according to McDivitt. The astronaut *did* see a nearby satellite, but did not succeed in getting a photo; he never even touched the movie camera. Yet UFO groups have selected this as one of the "four best UFO photos ever taken" and theorize that the "tail" is actually a "plasma jet" for interplanetary propulsion.

Photo of nose of Gemini-7 with sunlight gleaming off two rocket thrusters. Dark nose almost blends in with dark earth background.

With the help of airbrushing, the Gemini-7 photo became a view of two glowing UFOs. Forgery was first published in Japan and subsequently in an American tabloid newspaper. Hoax eventually appeared in *Edge of Reality*, by Dr. J. Allen Hynek.

July 18, 1966—Gemini 10: John Young and Mike Collins saw a large, cylindrical object accompanied by two smaller, bright objects, which Young photographed. NASA failed to pick them up on screens. *The astronauts reported two bright fragments near their spacecraft soon after launch, presumably pieces of the booster or of some other satellite. No photos were taken. They were out of range of NASA radar at this point anyway. Dramatization of ordinary space event.*

September 12, 1966—Gemini 11: Richard Gordon and Charles Conrad reported a yellow-orange UFO about six miles from them. It dropped down in front of them and then disappeared when they tried to photograph it. *The astronauts described the close passage of another space satellite, identified by NORAD as the Russian Proton-3 satellite but later shown to have been some other object. The men got three fuzzy photos, which, much blown up, have been widely published. But their eyesight accounts describe a solid satellite-looking object on a ballistic nonmaneuvering path.*

November 11, 1966—Gemini 12: Jim Lovell and Edwin Aldrin saw four UFOs linked in a row. Both spacemen said the objects were not stars. *Indeed they were not, since the astronauts were talking about four bags of trash they had thrown overboard an hour earlier! Deliberate misquotation by a UFO-book author.*

December 21, 1968—Apollo 8: Frank Borman and Jim Lovell reported a "bogie"—an unidentified object—ten miles up. *Actually, Borman referred to a "bogie" on his first space-flight three years before, describing some pieces of debris associated with his spacecraft's separa-*

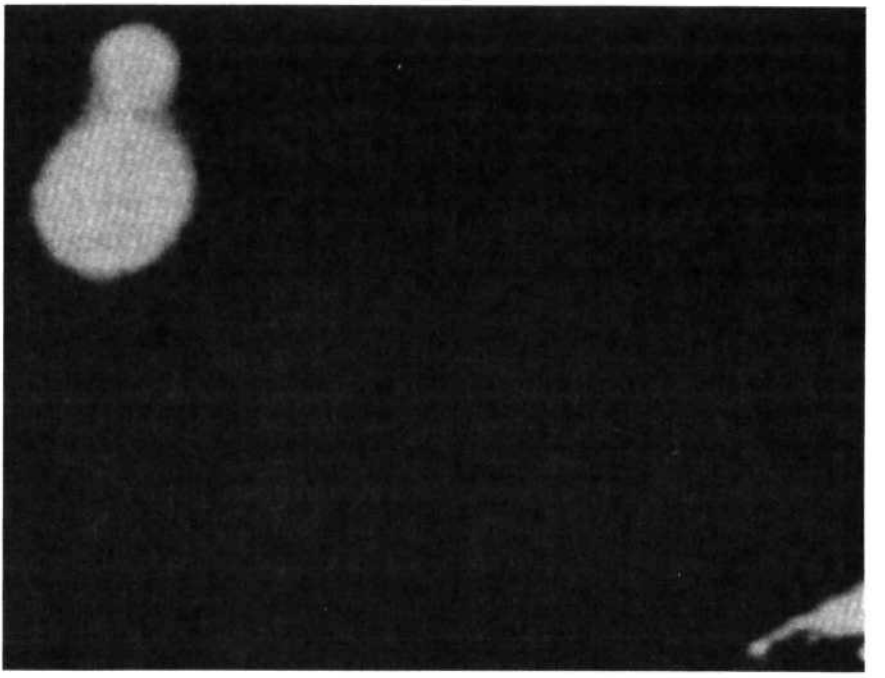
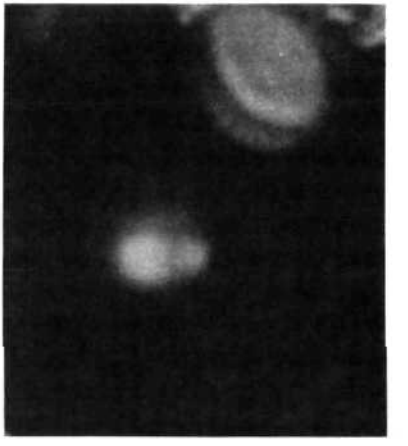


Photo of "Snowman UFO" reportedly made by "Buzz" Aldrin in lunar orbit (also described as "a mass of intelligent energy" in *Science Digest*). A series of pictures of this event appeared in a Japanese magazine, were widely publicized in America by Bob Barry (20th Century UFO Bureau), and have now been entrenched in UFO folklore.

The forgeries have been widely printed in the UFO media, along with fabrications about "NASA cover-ups."



The "Snowman UFO" photo is a forgery. Scenes such as this one from Apollo-11 film magazine "F" were heavily retouched to eliminate other reflections and accentuate sharpness of primary reflection of interior lights.

tion from the booster rocket. The reference to Apollo 8 is careless, possibly even fictitious.

July 16, 1969—Apollo 11: This was a mission on which a UFO reportedly chased the spacecraft. *"Reportedly," indeed, but not very accurate. Actually, several UFO stories have attached themselves barnacle-like to man's first moon landing. A photo of an insulation fragment taken soon after third-stage separation has been widely published as a "UFO." The astronauts watched their booster through a telescope on the way to the moon. A series of "UFO photos" allegedly taken by astronaut Aldrin in lunar orbit are actually forgeries by a Japanese UFO magazine. An alleged "astronaut radio conversation" describing a UFO ambush is a hoax.*

November 14, 1969—Apollo 12: Astronauts Pete Conrad, Alan Bean, and Dick Gordon said a UFO accompanied them to within 132,000 miles of the moon, preceding them all the way. *No, they never said that. They were joking with the ground control room about a tumbling piece of their booster rocket that was flashing in the sky. UFO buffs completely misunderstood the meaning of the conversation and conjured up a UFO. On the way back to earth, the astronauts were puzzled by a light between them and the earth, which turned out to be the reflection of the moon behind them on the night-time Indian Ocean below them.*

Many other "astronaut reports" have been added to this list, including photographs from Skylab (of a passing satellite, distorted by some

Strange squiggle photo from Skylab is probably a film or camera fault, since crew testimony and other photos show this was a bright point source—clearly a nearby artificial satellite.

camera artifact), from Apollo lunar flights (movies showing debris floating around inside the cabin), and from other Mercury and Gemini flights. None, when investigated with an appreciation of the actual space-flight environment, appears to be "extraordinary" or "unusual," although many sightings of passing satellites remain technically "unidentified," since the actual satellite has never been named (nobody has taken the trouble to spend several hours of computer time searching memory banks).

The entire phenomenon of the "astronaut UFO sightings," however, does explicitly demonstrate the carelessness and lack of verification among UFO circles eager to exchange the latest hot stories without any regard for authenticity or accuracy. Skeptics have claimed that this characteristic is not limited to the "astronaut UFO sightings." The topic is not one to which UFO specialists can point with pride in their own behavior and standards of reliability.

Closing note: A common claim is that there is some sort of NASA "cover-up" of secret photographs and/or voice transcripts from space. In fact, every photograph taken by NASA in space is available for publication and can be inspected by accredited news media representatives (there are tens of thousands of photos—there is no way to arrange public viewing). And volumes and volumes of voice transcripts are readily available at Houston.

Often astronauts are quoted about UFOs. Sometimes they are referring to experiences they have had before or after their roles in the space program. In other cases they are making general statements based on reading the news media. Many quotations are fictitious. Only one astronaut claims to have seen a UFO in space, and that is Jim McDivitt, who stipulates that *his* definition of a UFO covers the probability that his object was some other man-made satellite which has not been identified. He does not think it was an alien space vehicle or any such similar "real UFO" manifestation. •

Sleight of Tongue

Ronald A. Schwartz

> . . . words still manifestly force the understanding, throw everything into confusion, and lead mankind into vain and innumerable controversies and fallacies.
>
> —Francis Bacon, *Novum Organum*

Several years ago Peter Hurkos, a reputed psychic, was extrasensorially perceiving a telephone caller's past, present, and future on a local audience-participation radio program. The listening audience was assured that the caller was a complete stranger to Hurkos. During this telepathic demonstration, Hurkos, who uses a thick Dutch accent, said, "I see a duk" (rhymes with "took"). The caller responded, "Why, that's amazing! Our dog is right here in the room with me." The woman continued to be amazed as Hurkos kept seeing things from afar. Pondering this exchange, it occurred to me that "duk," as Hurkos pronounced it, could sound like a lot of things other than dog, such as: duke, dock, doc, duck, and so on, depending upon the hearer's expectation or orientation. What is heard is what the hearer brings to the stimulus. By presenting such an ambiguous stimulus Hurkos has greatly expanded the domain of possible "hits," because the listener in all probability will be able to extract something from his environment to correspond.

The more closely I listened to Hurkos, the more I realized how little he actually said and how much the callers were contributing to his performance. For example, one exchange went:

> Hurkos: One, two, three, four, five—I see five in the family.
>
> Caller: That's right. There are four of us and Uncle Raymond, who often stays with us.

It is curious that the gull unwittingly tries so hard to get duped. He often

goes to considerable lengths to make the stimulus intelligible and in accord with something from his experience.

What Hurkos is practicing is magic, but the props for his art are words. As with ordinary magic the art is often subtle and ingenious. Hurkos and other psychics are just full of tricks, and new ones are continually being invented which baffle laymen and scientists alike. Sometimes they even baffle other magicians; but this is less likely, because magicians are usually more adept at discovering the ruse.

Once the unwitting complicity is established the telepathee is psychologically primed for almost any utterance. For example:

> Hurkos: I see an operation.
>
> Caller: (no response)
>
> Hurkos: Long time ago.
>
> (Extending the domain. Psychics are partial to operations; almost everybody has had one or is planning to have one.)
>
> Caller: No. We have been very lucky.
>
> Hurkos: (somewhat angrily) Think! When you were a little girl. I see worried parents, and a doctor, and scurrying about.
>
> Caller: (no response)
>
> Hurkos: (confidently) Long time ago.

At this point the psychological tone is such that the observers feel that Hurkos is right and that the dim-witted caller can't even remember her serious childhood operation. The caller feels this way too.

> Caller: (yielding) I cannot remember for certain. Maybe you are right. I'm not sure.

Of course he is right. He is so confident and she is so uncertain. As extraordinary as it sounds, the mood is such that participants who disagree with the psychic come off as obstinate or perverse, as though they are deliberately trying to sabotage the effort.

When Hurkos gets going, the assault is truly aggressive. He verbally connects, dodges, bluffs, and weaves, always keeping the opponent off

balance. Consider the following ESP demonstration aired on a local TV show. The moderator asked for a volunteer to come up and give Mr. Hurkos a personal object to hold. The volunteer was an attractive female who looked to be in her early thirties. Hurkos was at this time looking directly at the lady, although he said at the beginning of the show that he wanted "to see the people not at all."

Moderator: Well, I think we are ready with our first very attractive guest. Have you ever met or spoken to Mr. Hurkos?

Woman: No.

Hurkos: Oh, my God, your mama had an operation! Did mother have an operation?

Woman: Yes!

Hurkos: And thank the Lord that she is alive! She had a double operation.

(Stop! Just what exactly is a double operation? Two operations? Two organs involved? Two surgeons? Two lumps? You'll see we never get to find out.)

Woman: Yes, you are correct—I know what you mean.

Hurkos: (nodding knowingly) You have something of your mother? (long pause)

Moderator: Do you have anything of your mother's?

Woman: No, I don't.

(Watch out Hurkos. Try nonsense.)

Hurkos: Then why is it to give it no to you?

Woman: (long pause)

Moderator: Do you have something your mother gave to you?

(Hurkos, you are in trouble. The moderator has clarified the question.)

Woman: (long pause)

Hurkos: The wallet.

Moderator: The wallet. Did she give you a wallet?

Woman: (embarrassed and confused) Yes!

Masterful! At first the question implied that the item was on her person, but Hurkos, missing on that, said "the wallet." In this way the domain got expanded by the moderator from "do you have" to "did she give," the latter implying only ownership. The "hit" was possible because the original stimulus was ambiguous and because almost all girls at some time get wallets from their mothers.

The next line advances cleverly. Hurkos now knows that she does not have it on her person, but that she must have a wallet so it should be in her purse left by her seat.

Hurkos: Where is it? I will go get it for you. (laughter) Where is the purse?

Woman: Uh.

Hurkos: If you was my daughter I would spank you. (laughter) The reason why I tell you this—can I have your wallet? It is lousy money.

Woman: Do you know what . . . I took it out of my purse just before I left the house. It was too bulky.

(One in a hundred! Oh well, it doesn't make any difference now. Her original acknowledgment of the gift was so impressive. On to other areas.)

Hurkos: When did Mommy went to the doctor? When?

Woman: Last—

Hurkos: Sept—

Woman: Week.

Hurkos: (loudly) No, no you are wrong!

Woman: Maybe, I might be wrong.

Hurkos: Was it nine days ago, on a Monday?

Woman: It could be.

(Hurkos had lightly guessed September. The gull told the correct date and Hurkos not only switches to her account but makes it seem like she is a little off in her recollection and that he knows precisely when Mommy visited the doctor. The woman acquiesces in the face of his conviction.)

Hurkos: Who is Ann?

Woman: Ann? I have an aunt. My aunt's name is Ann.

Hurkos: Yes. She has trouble with her legs too—left leg.

Woman: Could be.

(At this point the victim is primed for almost anything.)

Hurkos: And I see you married.

(Now or later?)

Woman: Yes.

Hurkos: How is it possible that you fell in through the bed? Is not normal.

Moderator: Did you fall off the bed?

Woman: No.

(If the moderator had not clarified the question the "no" would have been less likely.)

Hurkos: 'Bout a year ago?

Woman: I do not remember.

(That's better, now her memory is faulty.)

Hurkos: I don't see number five, but only see three. There gonna be three. How many are in the family?

Woman: Well, we have two now.

Hurkos: Yeh, that is what you think. (laughter)

(". . . only see three" and "there gonna be three" permits this latitude. Of course now the poor thing probably thinks she is pregnant.)

Moderator: Congratulations.

Hurkos: (loudly) I must say your husband is a very hard worker.

Woman: That is very true.

Hurkos: (loudly) And he acts like a child!

(All wives see this.)

Woman: Yes.

Hurkos: (screaming) This man don't have the time to relax! He always busy. He married with you, but he is married with his job!

(Elaboration of her acknowledgment of her husband's diligence.)

Woman: Very true.

Hurkos: (still screaming) And he, I don't want to see work with a whole bunch of peoples!

(This could mean almost anything.)

Woman: That is right. Very true!

Hurkos: Did you lose your bracelets?

Woman: I did lose a (pause)

(A desperate search is initiated for any item that could be even remotely corroborative.)

Hurkos: Did you got it too?

Woman: I got a pin. Yes, I lost a pin.

(Loss of bracelets confirmed by loss of a pin!)

Hurkos: You are a very good person. You are against the marriage a little bit but that came over.

Woman: That is very true!

(In her strong confirmation Hurkos is given a clue.)

Hurkos: (at the top of his lungs) When you want to break the marriage that time he did not have a chance. When you said, "If I don't, if I don't want him and I lose him—I like him, I am not listening to anybody—I want a want a want, or get the house!" This is correct?

Woman: That is fantastic!

Hurkos: Bye-bye. (huge audience applause)

(Absolute victory from nonsense.)

Moderator: How many percent would you say he is correct?

Woman: Oh, I would say ninety-five percent.

Moderator: (to audience) I just asked her how many percent she thought he was correct and she said almost a hundred percent.

A really impressionable gull can produce a most dramatic effect. Consider this interaction with a middle-aged male.

Moderator: Have you ever met or spoken with Mr. Hurkos?

Man: No.

Hurkos: May I have your glasses, please?

(Symbolic gesture of removing man's sight and giving it to Hurkos?)

Man: (gives Hurkos his glasses) Here.

Hurkos: Sir, (loudly) why did you finish university?

(Here we go again. Hurkos has it both ways. It sounds like he is asking both why the man did and why he did not finish school.)

Man: Well, the war broke out. I had no money to finish it.

Hurkos: But you have brilliant mind. You have a lot of ideas and you can bring those together.

(Most people would agree.)

Man: Yes.

Hurkos: And you was working when you were nine years old, sir.

Man: Well not exactly. I was helping, yes.

(Helpful, indeed.)

Hurkos: One, two, three, four, five—how many people are in the family, sir?

(Again, any one of the above is a "hit.")

Man: Six.

Hurkos: Five besides you.

Man: Five besides me, yeh.

Hurkos: But you are wrong, it is not true. (pause) There were seven in the family, one died very young and are six now. One died very young.

Man: That I don't remember.

(Boggles the mind. Can't recollect losing a member of the family!)

Psychology has something to tell us about why Hurkos and other of his ilk are so effective. A number of psychological principles are operating which contribute to the ESP effect. Specifically, investigation into the artifacts in behavioral research has shown that more dominant experimenters effect greater inducement of their expectation on their subjects than less dominant experimenters. Also, it has been demonstrated that experimental subjects generally try to comply with the demand characteristics of the situation, that is, try to be good subjects. It is likely, therefore, that the excessive compliance to Hurkos we've observed is simply due, in part, to his excessive demand and the subject's natural inclination to comply.

Added to this we have the P. T. Barnum Effect—the willingness of people to accept a general personality description as accurate for themselves. Much of the psychic's output is of this variety. Too, the phenomenon of prestige suggestion—the tendency for prestigious names to compel consent or approval regardless of the merits of their argument—is no doubt operative, for psychics usually get lavish billing.

Most important, there is the well-known effect of stimulus ambiguity on conformity. Conformity studies have shown that people are more

inclined to acquiesce when they are uncertain of their perception. This effect, of course, is Hurkos's stock-in-trade. Since perception is a synthesis, the more ambiguous the stimulus, the more the construction is determined by the perceiver. The skilled use of ambiguity is very convincingly precise because the gull is responding to his own internal construction, which naturally seems right or true to him. Ambiguity tends to permit an easy internal confirmation.

It's a good bet that subject complicity is the main explanation for all sorts of wondrous phenomena: clairvoyance, telepathy, precognition, astrology, and so on. Whenever people are called upon to perceive the seer's message, their perception can be influenced and shaped.

The eagerness with which people latch on to the fanciful idea of extrasensory perception to explain the apparent accuracy of the utterance, rather than to the recognition of their own complicity, is the really intriguing aspect of the demonstration. Perhaps recognition of one's own contribution is just too lackluster an explanation to be given much credence. Our persistent delight with fanciful explanations suggests that skilled practitioners of sleight of tongue will enjoy a bright and prosperous future. ●

INVESTIGATING THE SIRIUS "MYSTERY"

Ian Ridpath

Did amphibious beings from the star Sirius visit the earth 5,000 or more years ago and leave advanced astronomical knowledge that is still possessed by a remote African tribe called the Dogon? This astonishing claim was put forward in 1976 by Robert Temple in his "ancient astronaut" book, *The Sirius Mystery.* An astronomer, familiar with the Sirius system, would say no, because astronomical theory virtually precludes the possibility that Sirius is a suitable parent star for life or that it could have habitable planets. But most of Robert Temple's readers would not know enough astronomy to judge the matter for themselves. Neither would they find the relevant astronomical information in Temple's book, most of which consists of brain-numbing excursions into Egyptology. (Isaac Asimov has been quoted by Temple as having said that he found no mistakes in the book; but Temple did not know that the reason for this, according to Asimov, was that he had found the book too impenetrable to read!*) Even the BBC-TV Horizon investigation on ancient astronauts (broadcast as part of the PBS "Nova" series in the United States), which did an otherwise excellent demolition job on the more extreme fantasies of Erich von Däniken, left the Sirius problem unanswered because of its extreme complexity. Yet an answer is needed, because the Dogon legends about a companion to Sirius are claimed to originate before any terrestrial astronomer could have known of the existence of Sirius B, let alone its 50-year orbit or its nature as a tiny, con-

*Editor's note: See Asimov's essay, "The Dark Companion," in his *Quasar, Quasar Burning Bright* (Doubleday, 1978), in which he says he is embarrassed by his stupidity in not specifying that his comment, made only "to get rid of him [Temple] and to be polite," not be quoted. "I assure you I will never be caught that way again."—*K.F.*

densed white dwarf star, all of which the Dogon allegedly knew. So what is the truth about the Dogon and Sirius? Does astronomical and anthropological information omitted by Temple help us to resolve this most baffling of all ancient astronaut cases?

First, let's recap Temple's story. At the center of the mystery are the Dogon people living near Bandiagara, about 300 kilometers south of Timbuktu, Mali, in western Africa. Knowledge of their customs and beliefs comes from the French anthropologists Marcel Griaule and Germaine Dieterlen, who worked among the Dogon from 1931 to 1952. Between 1946 and 1950 the Dogon head tribesmen unfolded to Griaule and Dieterlen the innermost secrets of their knowledge of astronomy. Much of this secret lore is complex and obscure, as befits ancient legends, but certain specific facts stand out, particularly those concerning the star Sirius, with which their religion and culture is deeply concerned. In the information imparted to the French anthropologists, the Dogon referred to a small and super-dense companion of Sirius, made of matter heavier than anything on Earth, and moving in a 50-year elliptical orbit around its parent star. The white dwarf companion of Sirius which answers to this description was not seen until 1862, when the American optician Alvan Graham Clark spotted it while testing a new telescope; the super-dense nature of white dwarfs was not realized until the 1920s. But the Dogon Sirius traditions are at least centuries old. How can we account for the remarkable accord between ancient Dogon legends and modern astronomical fact?

Temple's answer, since espoused by Erich von Däniken (of course!), was that the Dogon were told by extraterrestrial visitors. A Dogon legend, similar to many other tales by primitive people of visits from the sky, speaks of an "ark" descending to the ground amid a great wind. Robert Temple interprets this as the landing of a rocket-powered spacecraft bringing beings from the star Sirius. According to Dogon legend, the descent of the ark brought to Earth an amphibious being, or group of beings, known as the Nommo. "Nommo is the collective name for the great culture-hero and founder of civilization who came from the Sirius system to set up society on the Earth," Temple explains in his book. The Nommo were amphibious, he presumes, because water would keep them cool and absorb short-wavelength radiation from the hot star Sirius.

Much of Temple's book is devoted to establishing that the Dogon share common roots with Mediterranean peoples. This explains the cen-

tral place occupied by Sirius in Dogon beliefs, because the ancient Egyptians, in particular, were also preoccupied with Sirius, basing their calendar on its yearly motion. But is there any explanation of the apparent Dogon belief in life in the Sirius system?

First, let's look at what astronomers know about Sirius to see if it is at least theoretically plausible that advanced life might have arisen in its vicinity. Sirius A, the brightest star in the night sky as seen from Earth, has a mass 2.35 times that of the sun. Its white dwarf companion, Sirius B, has a mass of 0.99 suns. Stellar evolutionary theory tells us that the most massive stars burn out the quickest, so that originally Sirius B must have been the more massive of the two, before burning out to become a white dwarf. Probably Sirius B spilled over some of its gas onto Sirius A during its aging process, so that the original masses of the two stars were approximately the reverse of what we see today.

A star with twice the sun's mass, as Sirius B probably had, can live for no more than about 1,000 million years before swelling up into a red giant; this does not seem long enough for advanced life to develop. But had life evolved, it would have disappeared during the red giant stage of Sirius B, when any nearby planet would have been roasted by the star's increased energy output, followed by a stellar gale for at least 100,000 years as hot gas streamed from Sirius B to Sirius A. During this mass transfer the two stars would have moved apart, thereby destabilizing the orbits of any planets in the system. According to observations of Sirius B as analyzed by H. L. Shipman of the University of Delaware, Sirius B has been a cooling-down white dwarf for at least 30 million years. Sirius B is now emitting soft x-rays, so that life in the region of Sirius would not be very pleasant today. But in any case, Robert S. Harrington of the U.S. Naval Observatory has recently shown that planetary orbits in the "habitable" zone around Sirius, defined as the region in which water would be liquid, are unstable. So there are unlikely to be any amphibious beings living on planets in the Sirius system today, if indeed any such beings ever lived there.

Temple offers one prediction which allows a test of his theory. In his book he says: "What if this is proven by our detecting on our radio telescopes actual traces of local radio communications?" To help in my investigation of the Sirius mystery, I asked radio astronomers Paul Feldman at the Algonquin radio observatory, Canada, and Robert S. Dixon at the Ohio State University radio observatory, both of whom are carrying out searches for extraterrestrial signals, to listen to Sirius. They

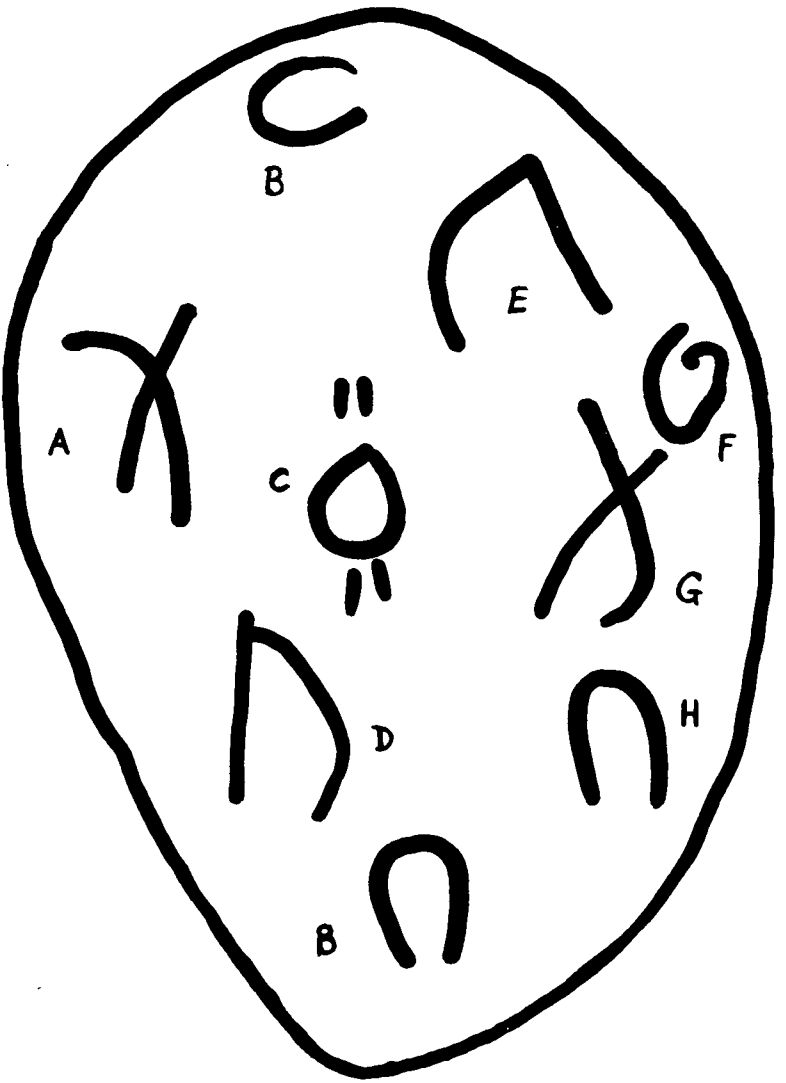
would normally have paid the star no attention, because of the extreme unlikelihood of its supporting life. In April 1977 both radio astronomers listened to Sirius on different wavelengths, without detecting any artificial signals.

With this information in mind, let's look more skeptically at the Dogon legend. Immediately, we encounter a surprise: the Dogon maintain that Sirius has two companions, not one. These companions have male and female attributes, respectively. It seems that they are not to be interpreted literally as stars, but as fertility symbols. Nowhere is this better shown than in a Dogon sand diagram of the complete Sirius system, shown in the illustration redrawn here from a paper by Griaule and Dieterlen. Its description, given in the caption from information by Griaule and Dieterlen, is clearly symbolic; Temple chooses to interpret it literally. On pages 23 and 25 of his book he gives his own modified version of this diagram, retaining the symbol for Sirius, one of the positions of Sirius B, and the surrounding oval; all else is omitted. He then interprets the surrounding oval meant to represent "the egg of the world," as the elliptical orbit of Sirius B around Sirius A, even though the symbol equated with Sirius B is drawn as lying within the oval, not on it. This is Temple's basis for saying that the Dogon "know" Sirius B orbits Sirius A in an ellipse.

The Dogon are also supposed to know that Sirius B orbits every 50 years. But what do they actually say? Griaule and Dieterlen put it as follows: "The period of the orbit is counted double, that is, one hundred years, because the Siguis are convened in pairs of 'twins,' so as to insist on the basic principle of twinness." The Sigui ceremony referred to is a ceremony of the renovation of the world that is celebrated every 60 years (not 50). And the "twinness" referred to here is an important Dogon concept which explains why they believe Sirius must have two companions.

Is there any astronomical evidence that Sirius has more than one companion star? Some astronomers in the 1920s and 1930s thought they had glimpsed a third member of the Sirius system, but new and more accurate observations reported in 1973 by Irving W. Lindenblad of the U.S. Naval Observatory, Washington, D.C., showed no evidence of a close companion to either Sirius A or Sirius B.

The whole Dogon legend of Sirius and its companions is riddled with ambiguities, contradictions, and downright errors, at least if we try to interpret it literally. But what can we make of the Dogon statement



Dogon sand drawing of the complete Sirius system, after Marcel Griaule and Germaine Dieterlen. A, Sirius; B, *po tolo*, the object equated with Sirius B, shown in two positions; C, *emme ya*, the sun of women, equated with Sirius C; D, the Nommo; E, the Yourougou, a mythical male figure destined to pursue his female twin; F, the star of women, a satellite of *emma ya*; G, the sign of women; H, the sex of women, represented by a womb shape. The whole system is enclosed in an oval, representing the egg of the world.

that Sirius B is the smallest and heaviest star, consisting of a heavy metal known as *sagala*? Sirius B was certainly the smallest and heaviest star known in the 1920s, when the super-dense nature of white dwarfs was becoming understood; the material of which white dwarfs are made is indeed compressed more densely than metal. Now, though, hundreds of white dwarfs are known, not to mention neutron stars, which are far smaller and denser. Any visiting spaceman would certainly have known about these, as well as black holes.

Perhaps one would forgive Robert Temple for believing that the Dogon had been visited by men from Sirius if their legend specifically stated so. But it does not! Nowhere in his 290-page book does Temple offer one specific statement from the Dogon to substantiate his ancient astronauts claim. The best he does is on page 217, where he reports that the Dogon say: "*Po tolo* [Sirius B] and Sirius were once where the Sun now is." Of this ambiguous statement, Temple comments: "That seems as good a way as any to describe coming to our solar system from the Sirius system, and leaving those stars for our star, the Sun." But this cannot conceal the fact that the whole Sirius "mystery" is based on Temple's own unwarranted assumption.

The parts of Dogon knowledge that are admittedly both ancient and profound, particularly the story of Nommo and the concept of twinning, are the parts that bear least relation to the true facts about Sirius. The parts that bear at least superficial resemblance to astronomical fact are most likely trimmings added in this century. Indeed, in view of the Dogon fixation with Sirius it would surely be more surprising if they had *not* grafted on to their existing legend some new astronomical information gained from Europeans, picking what fitted their purpose and ignoring the rest.

Carl Sagan has underlined how easily information gained from Westerners can be absorbed into native culture. He recounts the true case of the physician Carleton Gajdusek in New Guinea, who was approached by a scientific colleague who had found that some local natives believed that a certain disease was transmitted in the form of an invisible spirit that entered the skin of a patient. The native informant had sketched with a stick in the sand a circle outside which, he explained, was black, and inside which was light. Within the circle the informant drew a squiggly line to represent the appearance of these invisible malevolent spirits. How did the natives get such an astounding insight into the transmission of disease by microbes? Years earlier, Gajdusek himself had shown the

natives the appearance of a disease-causing germ through his microscope, and the sand drawing was simply the natives' recollection of this deeply impressive sight.

It is all too easy for Westerners to think of African tribes as isolated, uneducated, and ignorant. But the Dogon are not isolated. They live near an overland trade route, as well as close to the banks of the Niger River, an important channel of trade. Any number of travelers could have come into their midst, or Dogon tribesmen could have journeyed to the coast, where they might have met astronomically informed seamen. The Dogon have been in contact with Europeans since at least the late nineteenth century.

Nor are they uneducated and ignorant. Peter and Roland Pesch of the Warner and Swasey Observatory in Ohio have pointed out that French schools have existed in the Dogon area since 1907. Dogon tribesmen wishing to pursue their education have been able to do so in nearby towns. Then there are missionaries, who would naturally be interested in the legends of the natives. Missionaries from the White Fathers made contact with the Dogon in the 1920s. It is tempting to speculate that certain of the more specific details about Sirius B were grafted onto the existing Sirius legend at that time, because it was in the 1920s that astronomers were discovering the true nature of Sirius B as a tiny, super-dense star, and white dwarfs were being accorded the same kind of publicity as attends black holes today. Alas, there is no mention in the missionaries' summary reports of their activities that they discussed Sirius with the Dogon; if more detailed notes were published, these might throw more light on the origin and antiquity of Dogon myths.

The point is that there are any number of channels by which the Dogon could have received Western knowledge long before they were visited by Griaule and Dieterlen. We may never be able to reconstruct the exact route by which the Dogon received their current knowledge, but out of the confusion at least one thing is clear: they were not told by beings from the star Sirius.

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Book Reviews

Biorhythm: A Personal Science. By Bernard Gittelson. Warner Books, New York, 1977. Paperback, $2.95.

Reviewed by James Randi

We are told, in the introduction to this book, that George Thommen (to whom the book is dedicated) appeared on the Long John Nebel radio show on WOR in New York in November of 1960 to warn of a possible critical day for actor Clark Gable on the sixteenth of that month. Gable had suffered a heart attack six days earlier and was hospitalized. On the sixteenth, Gable succumbed to a second heart attack, and Thommen had created a sensation. The prediction was said to have been made by the "science" of biorhythms.

My personal experience with Thommen some years later was somewhat less sensational. I inherited the interview show from Nebel when he moved to another station, and Thommen was among my first guests. I took the opportunity of asking him for a personal biorhythm chart, and one for my secretary as well. He obliged us both, and they arrived with our names on the neat covers. Since I'd already been through the investigation of this "science" and had read Martin Gardner's discussion of Wilhelm Fliess and his numerology nonsense, I was less interested in how well it worked for me than I was in an experiment that I planned.

Sure enough, several listeners called in asking for information on how to obtain a personal chart. I selected one lady who was willing to cooperate in a test, and she agreed to accept a free chart in return for a report at the end of two months on how successful the chart seemed to be. She promised to keep a day-by-day diary and to rate the chart for aptness. The results were quite interesting.

At the end of the two months, she called in to tell me that I should take this matter very seriously, since the chart had been "at least 90 percent accurate" in her case. I expressed interest in these results and told her I wanted to check the identification on the folder to be sure that she had received the correct chart. To our mutual astonishment, we discovered that she'd been sent *my* chart, not the one intended for her, and I blamed the whole thing on my secretary. In actuality, I knew very well that she had my chart, but I didn't let on. I promised to send her the correct chart to check against her diary. The very next day, she called in to report that *this* one was *even more accurate*, if that were possible! We were both thrilled, until we checked further, and I announced that—by mistake, of course—

she had received *my secretary's* chart. There was a short pause, then a snort, and the lady hung up on me. I could hardly blame her. She had been taken in by the after-the-fact rationalization of the data, as have so many thousands who have followed the undulating curves and erratic reasoning necessary to make the facts fit the theory.

Says Gittelson in his Notes: "Biorhythm does not always work, but very few things do." True. The point is, does it work at all? And if so, any less from random charting than from the methods used? (See also "Biorhythms: Investigations of a Pseudoscience," by William Sims Bainbridge, in the Spring/Summer 1978 SKEPTICAL INQUIRER.)

This book provides many answers to this question. In general, it adds little to the other publications that have crowded bookshelves since Thommen brought biorhythm to this country. The author spends much time on discussions of such long-studied phenomena as "circadian rhythm." Such a natural cyclic rhythm occurs in plants and animals every 24 hours, whether the subject is in a position to "know" of the rising and setting of the sun or not. Thus a plant contained in a completely artificial environment tends to react to the natural world outside and its diurnal rhythm. In step with other pseudosciences, biorhythm borrows respectability from recognized and demonstrable phenomena.

Eventually, we are brought to a discussion of Fliess' and his preoccupation with numbers and cycles. The point we must direct ourselves to is whether this book has any proof at all about whether biorhythm actually works. Gittelson gives us much information on this question. It turns out that he uses many of the rationalizations that astrologers use, and in much the same way.

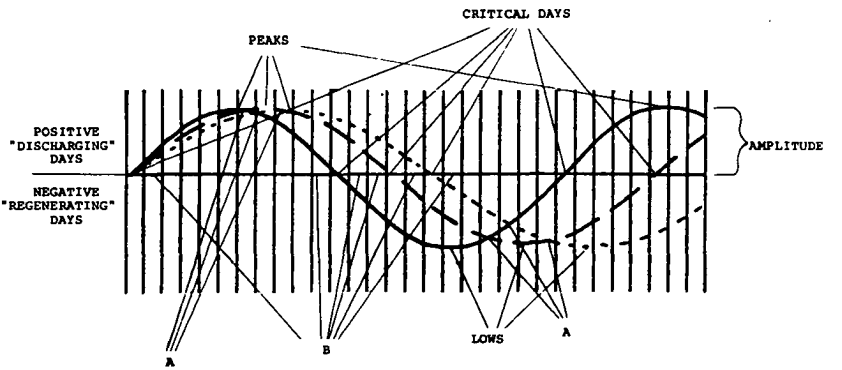

FIGURE 1. A supposed biorhythm curve. The solid line represents the "masculine" or physical cycle of 23 days. The dashed line is the "feminine" or emotional cycle of 28 days. And the dotted line is the intellectual or learning cycle of 33 days. Supposedly critical days occur where any curve crosses the zero line. Where two curves cross the line, it is a "double-critical" day. Where the curve is above the zero line, it is said to be positive, or "discharging." That factor is thus strong if above the line, weak if below. "Half-periodic" days occur before and after "critical" days (marked "B"). This sample shows the first month of a human life, presuming the person is born at 12 noon on the first of the month. Each vertical column is a day of the month, starting at the left.

It seems that biorhythm does not compel, it only impels, as our astrologers say of *their* "science." Thus any deviation in the agreement between fact and theory is forgivable. But Gittelson is quite aware of this fault in reasoning, and says so. He also gives us ample proof that *any* analysis is congruent with the theory. For example, examine these quotations from the book for the many "outs" and excuses that we may employ to fit fact to theory and vice versa:

> Regarding the first requirement—the ability of biorhythm to predict behavior—there is a real problem of interpretation. The three great rhythms are interdependent. None of them is so strong that it overwhelms the other two; they always act in concert to affect us. True, on critical days there is a good chance that the rhythm or rhythms showing temporary instability will dominate, but never completely. On an emotionally critical day, for example, it sometimes happens that the strength of the physical and intellectual rhythms neutralizes any threat. This is even more likely on non-critical, or mixed, days which are the ones which occur most often. If all three rhythms are in the low (or recharging) phase, you are not likely to perform at your peak. But exactly how far below your best you will in fact perform remains an area of controversy and uncertain interpretation. (p. 49)

Regarding forecasts of performance in sports: "Benthaus . . . believes that a player's class will always show—that a first class player at a biorhythmic lowpoint will always prevail over a second class player at a biorhythmic peak." (p. 103) So we have an excellent excuse for failure of a performance to agree with a prediction of the chart.

"If biorhythm does *not* seem to work for you, you may be one of those rare individuals who are 'arhythmic' and do not respond fully to internal cycles." (p. 128) And we have been informed that, on top of all this, people who are "arhythmic" may pop back into rhythm at any time!

"Gunthard [says] some people are 'rhythmists' and some are 'non-rhythmists'; or, to put it another way, some people appear to be more sensitive to biorhythms than others . . . is it simply that some people develop different ways of dealing with biorhythms, and that some of these methods effectively mask biorhythmic effects? Or is it that the strength of biorhythms—the amplitude of the sine-waves used to represent the curves—varies in different individuals, and also for the same individual at different times?" (p. 131)

"Some biorhythm research has shown heightened vulnerability to accidents and disease not just on the critical days, but also on the half-periodic days that immediately precede and follow each critical day." (p. 132) So now we have *three times as many* critical days as we did before! How convenient. Gittelson says that there are 20 percent of the days in a year that are "critical," that is, when a curve crosses the "zero" line. (My calculations show 22 percent, but I'll give him 2 percent. Now we have a possible 60 percent (or 66 percent) and the year looks pretty ominous!

"Wallerstein and Roberts . . . found that the *direction* in which a rhythm was moving could be as important—and perhaps more important—than whether the rhythm was above or below the zero line." (See Figure 1 for the latitude this gives us in interpretation!) And: "Several researchers who have dealt with ac-

cidents and biorhythm have suspected that days when two rhythms cross each other while going in opposite directions—regardless of whether they cross in the positive or negative phases—are potentially dangerous days." (p. 135) (Again, see Figure 1, points labeled "A.")

I think we have pretty potent indications in this selection of interpretations to show that we can make the theory fit *anything*. At this point in the evolution of this "science," it is time to throw out the theory; such convoluted efforts to rationalize are ludicrous.

The author spends several pages of his book to claim that major industries in the United States have used biorhythm, or at least have looked into it. He says that Proctor & Gamble experimented with it but adds that they deny both the experiment and its successful results. He tells us that United Airlines, Allegheny, Continental, Pan American, and Trans World Airlines have explored the biorhythm theory and that they all disavow their experiments or interest. But United has done much more than that. As reported in the Spring/Summer 1978 SKEPTICAL INQUIRER, United's *Executive Air Travel Report* (published well before this edition of Gittelson's book) says officially that researchers found no correlation between negative phases of any or all biorhythm cycles and an increased number of aircraft accidents. Furthermore, no cycle—physical, emotional or learning—could be assigned a role in causing accidents.

And the book tells us that "United . . . pilots have not yet received charts"! Some 4,000 did, in this study!

Gittelson himself quotes some damning opinions about biorhythm. Dr.

Your Biorhythms BY BERNARD GITTELSON

BIORHYTHMS FOR JULY 15, 1978

PHYSICAL
Critical: 6, 17, 28, 40, 52, 63, 75 ....Limit exercise
Highs: 7-16, 30-39, 53-62 ....Your body can take it
Lows: 1-5, 18-29, 41-51, 64-74 ....This is a sluggish day

EMOTIONAL
Critical: 14, 26, 42, 56, 70, 84 ....Watch out, don't blowup
Highs: 15-27, 43-55, 71-83 ....You are in good spirits
Lows: 1-13, 28-41, 57-69, 86 ....Don't snap at people

INTELLECTUAL
Critical: 5, 21, 38, 54, 71, 87 ....Critical judgment off
Highs: 6-20, 39-53, 72-86 ....An alert day for you
Lows: 1-4, 22-37, 55-70, 88-85 ....Think before you act

Isaac Asimov's *permanent numbers are 5, 13, 26*

Figure your numbers here —
For your own *permanent* biorhythm number for the Physical (P), Emotional (E), and Intellectual (I) cycles, just follow these steps:

		P	E	I
STEP 1.	YEAR OF BIRTH			
STEP 2.	A-B MONTH OF BIRTH			
STEP 3.	DAY OF BIRTH			
	TOTALS			

YOUR PERMANENT NUMBERS

Step 1 — Year of birth. Read down the left hand column to find the last number in the year of your birth then go across to the appropriate decade. For instance, if you were born in 1947, your number for Physical would be 21, Emotional 17, Intellectual 19. Note whether your numbers are preceded by an A or B; this will be used for Step 2.

	1910-19			1920-29			1930-39			1940-49			1950-59			1960-69			1970-79		
	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I
0	A8	27	2	B3	11	24	A22	24	16	B17	8	3	A13	21	28	B8	5	15	A4	18	5
1	A6	0	4	A1	13	27	A19	25	18	A18	10	6	A10	22	28	A6	7	18	A1	19	7
2	B2	1	6	A21	14	28	B16	26	18	A12	11	8	B7	23	30	A3	8	20	B21	20	9
3	A0	3	9	A18	15	31	A14	0	21	A6	12	10	A5	25	0	A0	9	22	A19	22	12
4	A20	4	11	B15	16	0	A11	1	23	B6	13	12	A2	26	2	B20	10	24	A16	23	14
5	A17	5	13	A13	18	3	A8	2	26	A4	15	15	A23	27	4	A18	12	27	A13	24	16
6	B14	6	15	A10	19	5	B5	3	27	A1	16	17	B19	0	6	A15	13	29	B10	26	18
7	A12	8	18	A7	20	7	A3	5	30	A23	17	19	A17	2	9	A12	14	31	A8	27	21
8	A9	9	20	B4	21	8	A0	6	32	B18	18	21	A14	3	11	B9	16	0	A6	0	23
9	A6	10	22	A2	23	12	A20	7	1	A16	20	24	A11	4	13	A7	17	2			

Step 2 — Month of birth. Find the corresponding numbers for the month you were born. If your month is February, and your year numbers were preceded by a B, your month numbers would be 6 for Physical, 3 for Emotional and 31 for Intellectual. Enter your own numbers in the figure chart for Step 2.

	Jan.			Feb.			March			April			May			June			July			Aug.			Sept.			Oct.			Nov.			Dec.		
	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I
A	0	0	0	3	3	3	3	3	3	6	6	6	8	8	8	11	11	11	14	13	13	16	16	16	19	18	18	21	21	21	24	23	23	26	26	26
B	0	0	0	3	3	3	4	4	4	7	7	7	9	9	9	12	12	12	15	14	14	17	17	17	20	19	19	22	22	22	25	24	24	27	27	27

Step 3 — Day of birth. Enter your day of birth three times in the figure chart, once each for Physical (P), Emotional (E) and Intellectual (I).

Add the three columns to derive your *permanent* biorhythm numbers for your Physical, Emotional and Intellectual cycles. Now you can refer to today's biorhythm readings.

* 1979 Bernard Gittelson, distributed by Universal Press Syndicate.

FIGURE 2. Universal Press Syndicate has started distributing a daily biorhythm column by Gittelson to newspapers. An irony of this one is that it features the biorhythm "permanent numbers" (left center) of CSICP member Isaac Asimov.

Franz Halberg, of the University of Minnesota Medical School: "[George Thommen] is talking of immutable, fixed rhythms . . . As to any similarity with my own work, it's like Smith and Schmidt. We have only the name in common." Dr. John Hastings of Harvard: "This is not a serious subject being studied by serious scientists." Professor Colin Pittendrigh, Stanford University: "I consider this stuff an utter, unadulterated fraud." The National Institutes of Mental Health classes biorhythm as "a mythology." Yet Douglas Kelly, of the National Safety Council, says: "When chemistry was at the state where biorhythm is today, it was called alchemy. But alchemy became chemistry, and within 50 years research may do the same for biorhythm." Nonsense. Alchemy was dedicated to a search for the Philosophers' Stone, which was to change base metals into gold. It was never found, and peripheral facts that were discovered during the search were later incorporated into the true science of chemistry. The only future for biorhythms is to become an abandoned quest, and the case histories of poor logic and research that remain from its wreckage will be incorporated into abnormal psychology.

In summation, Bernard Gittelson has indeed covered the subject, and in doing so has provided us with good material with which to pursue a study of the matter. The evidence is all there in sufficient quantity for us to judge the validity of biorhythm theory. He quotes much of the bad press (though not all, or the book would be much thicker) and gives us a good sampling of the "outs" used to explain away failures.

Gittelson's book quotes Robert W. Bailey, of Bell Labs, in Piscataway, New Jersey, as saying, "If there's something to it, I haven't found it yet." It then points out that Bailey's work is "still in its early stages," and has "covered fewer than 300 employees." When interviewed by phone, Bailey was aghast at the reference.

Bailey, who works with the Human Technology Division of Bell Labs, told me that "many thousands of individuals" were charted by biorhythm and that "an intensive investigation" was carried out four years ago—well before this book was published. "It became very clear to us," he says, "that after having translations made of the original Fliess/Swoboda writings on the subject, it turned out to be a system of pure guesswork based on numerology. We looked at it as carefully as anyone has, and we found not one reliable fact in it."

Surely advocates of biorhythm cannot summon up the old excuse that parapsychologists are fond of—that scientists are unwilling to look at the evidence they present. Here we have a definitive, proper, and well-documented investigation into not only the roots of this so-called science, but its performance as well.

It simply does not work. •

True, False, or In Between: An Elective Course in Logical Thinking. By Donald A. Hiatt. Ginn and Company (Xerox), Lexington, Mass., 1975. 140 pp. Paperback, $2.50.

Reviewed by Lee Nisbet

A number of educators, especially high-school teachers, have expressed concern over the naive fascination of their students with the "paranormal." Most of these educators have requested bibliographies containing titles of "debunking" books. I wish to suggest here a complementary but distinctive approach to the problem of student credulousness.

Telling people that their beliefs are false and showing them *why* their beliefs are false generally are ineffective forms of persuasion. As an educator I have learned that students must fight the battle themselves if they are to learn anything lasting and worthwhile.

Teaching reasoning skills, the skills of applied deductive and inductive reasoning, is an extremely effective way of getting a student to confront his own beliefs.

Knowing how to reason and refusing to do so is a much more difficult position to maintain than simply not knowing how to think effectively. In the latter case you are simply an ignoramus, but in the former you are definitely a fool. Interestingly enough, students generally perceive this truth much more clearly and quickly than adults, ignorant or otherwise. *True, False, or In Between*, by Donald A. Hiatt, can contribute much toward creating the dilemma of having to choose between being the thinker or the fool.

The book teaches the student, on a step-by-step basis, how to evaluate whether evidence offered to substantiate conclusions actually does so and how to evaluate the truth of assertions that are offered as evidence.

The book has a number of features to recommend it. Hiatt's explanations of the meaning of logical terms and the procedures of analysis and evaluation are for the most part clear. Most important, however, is a multitude of easily understood examples of reasoning, invalid and valid, sound and unsound, which he uses to illustrate a point or to serve as an object of analysis. Especially effective is his use of advertisements for well-known products, which serve as splendid examples of deceptive devices to influence behavior. Many exercises in the book are especially instructive and interesting because they take the form of games that students can play using index cards or playing cards. There are even simple experiments to perform in the section on causal analysis. If the student has successfully worked through the five chapters covering arguments, assertions, evidence and its evaluation, inductive arguments, analogies, causal reasoning, deductive reasoning (categorical, hypothetical, and disjunctive syllogisms), and fallacies, a formidable arsenal of skills and insights will have been gained.

I believe the chances that significant learning will take place may well be high. Hiatt's use of interesting and familiar examples to illustrate and to analyze not only teaches reasoning skills but gives a student a sense of the relevance of

logical thinking and, more important, an awareness of its *power.* Adolescents love mastery. To be able to challenge the thinking of both their peers and the adult world with their new-found tools has to be exciting. The student now understands Bacon's aphorism "knowledge is power." What adolescent ever wants to be fooled or put down? Adolescents want to be on top. The use value of knowledge hence becomes abundantly clear.

The creative teacher can then select a variety of examples from the uncountable sources that bombard us with claims of "paranormal" phenomena. The students can now evaluate the claims themselves. What a dilemma they will find themselves in. To accept the unsupported or the unsound is to reject the very skills and power they have gained. No longer ignorant, but cursed with knowledge, they must now choose between playing the truth-teller or the fool. They must confront themselves. I recommend Hiatt's book to any high-school teacher wanting to give a course, or part of a course, dealing with claims of "paranormal" phenomena. •

Correction

In Richard de Mille's review of *Extrasensory Ecology* in our Spring/Summer 1978 issue, a phrase describing the submission of terror-entranced householders to bewitching thieves of ancient Mexico (p. 111) should have read "an institutionalized hypnosis" (not "hypothesis").

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—Robert R. Lockard, University of Oregon

From Our Readers

Dream world of professors?

As a writer who has been published in numerous occult publications (*Ancient Astronauts, Beyond Reality, Official UFO, UFO Report*) and a true member of the anti-establishment, I would like to report to your readers that I get exquisite pleasure in reading the SKEPTICAL INQUIRER. I truly enjoy your hysterical "scientific" articles, because they definitely indicate that the dream world which the professors have been living in their halls of poison ivy is on the verge of collapse. It is so difficult to maintain this dream world that it is virtually impossible to read such publications as *Reader's Digest* and *Science Digest*, watch television, and go to the movies without seeing the true reality of the occult world. Teaching in the halls of poison ivy has become a very frightening experience, because most of the students regard Erich von Däniken and Uri Geller as gods. Trying to argue with such students in the classroom could be very dangerous, because many of them are on drugs and could easily resort to violence. In my opinion your publication is like a historical document, recording the end of a corrupt and rotten system that never deserved to be established in the first place.

It is doubtful that the public, who has shown overwhelming support for the occult sciences, will shed any tears when your system finally collapses, because they are fed up with shelling out billions of dollars of their hard-earned money to support a bunch of nonproductive "intellectuals." Included in your group are the medical doctors and researchers who have even a better racket and rob the public of everything that is not nailed down. Even the pillar of the academic establishment, the *New York Times*, is so fed up with the waste of billions of dollars by the universities and scientific institutes to find a cure for cancer that the paper published a letter in its August 5, 1978, edition attacking this fraud. The medical doctor who wrote the letter, Charles Harris, accurately described the scientific establishment: "The problem with cancer research as it is funded today is that too often funding goes to entrepreneurs who represent themselves as scientists." One of the reasons why I find the SKEPTICAL INQUIRER so humorous is that your writers are always trying to prove that the people in the occult field are lying in order to make money. The only people who believe this fantasy, of course, are the professors and scientists who read your publication.

The writer I like best in your journal is Philip J. Klass, the avionics editor of *Aviation Week and Space Technology* and a man who is considered to be one of the top UFO "experts" in the world. For entertainment I love to read his articles in the back issues of *Aviation Week*, especially those from 1965 to 1975, which described how America's "air superiority" was winning the Vietnam War.

I also enjoy reading the articles

concerning the unpublished letters of Dr. Albert Einstein, where he attacks the occult field. However, if this great scientist was alive today it is doubtful he would write for your publication. In the November 18, 1954, edition of *The Reporter* he gave his opinion about the system which the SKEPTICAL INQUIRER is trying to save:

> To the Editor: You have asked me what I thought about your articles concerning the situation of the scientists in America. Instead of trying to analyze the problem I may express my feeling in a short remark: If I would be a young man again and had to decide how to make my living, I would not try to become a scientist or scholar or teacher. I would rather choose to be a plumber or a peddler in the hope to find that modest degree of independence still available under the present circumstances.

When I take a taxicab in New York City and the driver happens to be an unemployed Ph.D., I always give him Dr. Einstein's advice. This makes him feel better than if I added an extra 25 cents to the tip, because in point of fact he is definitely more productive in transporting people around the streets than filling their minds with a lot of lies and stealing money from their pockets. In the future I hope to meet many more unemployed scientists and professors driving taxicabs in New York.

Michael Cohen
Bronx, N.Y.

Gusmão's balloon

Ronald Story has been imprecise, if not misleading, on page 27 of the Fall/Winter 1977 issue. Father Bartolomeu Gusmão was indeed a Brazilian Jesuit. On August 8 (or 9), 1709, he flew a small hot-air balloon, *far* from man-carrying, in the great hall of the *Lisbão* court of King John of Portugal. It was probably the first of all hot-air balloons, but it was *not* a manned flight. (Story referred to it as Gusmão's "first flight." The good people of Santos may be overweening with local pride.)

While tradition suggests that Gusmão may have flown, there is no evidence for it. His drawing of an airship was not very convincing. He might have made glides once or twice.

There is a lot of recent scholarship about Gusmão, neglected in English sources till lately. I am sure "the little-known fact that Europeans were not the first" is little known, but very probably is not a fact at all.

Philip Morrison
Massachusetts Institute
of Technology
Cambridge, Mass.

Mummy's "living" cells

Ronald Story's excellent article, "Von Däniken's Golden Gods," prompted me to share with our readers a bit of my own research. In *Chariots of the Gods?* (Bantam paperback, p. 82), von Däniken wrote: "In March, 1963, biologists of the University of Oklahoma confirmed that the skin cells of the Egyptian Princess Mene were capable of living. And Princess Mene has been dead several thousand years!"

Since Egyptology is a special interest of mine, I decided to check out von Däniken's sensational claim. I couldn't find any reference to it in the *Reader's Guide to Periodical Literature* or *Biological Abstracts*, and I began to wonder if the story was perhaps a complete fabrication instead of just a misquotation. Finally I wrote directly to the University of Oklahoma. Many months later I received a letter from the University of Iowa Hospitals and Clinics. West A. Clabaugh, M.D.,

identified himself as the one who did the work on the Egyptian mummy in 1963. He stated that there was a "misunderstanding" (a very charitable way of putting it!) concerning his work. "We did see a lot of residual from normal-looking tissue," Dr. Clabaugh said. "However, the tissue was certainly not capable of any metabolic processes. It only had some of the normal architecture."

Scott J. Klemm
Rialto, Calif.

Selling the skeptical point of view

In some quarters of the scientific community there is alarm regarding the prevalence of nonsense and the widespread acceptance, by very large segments of the population, of an astonishing array of phenomena and beliefs for whose existence no acceptable evidence has ever been produced. I refer to UFOs of extraterrestrial origin, telepathy, psychokinesis, pyramidology, and the like, the list continuing ad nauseum.

Scientists are now and then called to task for allowing this situation to exist, for not vigorously setting forth before the public the opposing point of view, i.e., a view that offers alternative (and natural) explanations for so-called paranormal phenomena. Well, let us lay the blame for the present state of affairs where it belongs. To that end let me relate a brief history about my efforts to interest publishers in a proposed book devoted to considering some of the nonsense of our times from the skeptical point of view.

After I had finished *The UFO Enigma* with my late friend and co-author, Donald H. Menzel, it occurred to me that there was much more to be said in the general realm of irrational beliefs than we had had the space or time for in *Enigma*. I drew up a proposal for such a book. The first half (approximately) would be devoted to brief chapters concerned with quite a variety of what seemed to me to be irrational beliefs, and these accounts would be presented from the skeptical point of view. The second part of the book would be an extensive inquiry into how it is that in this age of technological progress so many live in the intellectual equivalent of the Dark Ages. I sent my proposal into editorial offices, and received prompt replies:

> We cannot come up with sufficient enthusiasm . . . for this project. Our experience tells us it is hard enough to sell books which go against one specific fad or superstition . . . when it comes to dealing with practically every superstition at once, as you propose . . . people just don't seem to turn to books.
>
> Unhappily I don't think your demolition of the wishful thinkers is for our list. While I deplore the Velikovskys, et al., I'm not personally keen on buying a whole book of knocks, and I wonder how many other buyers would be . . .
>
> I have discussed your proposal with my colleagues here and though we can appreciate your distaste for many of the irrationalities of our times, we feel such a book would have a hard time in the marketplace.

There were other responses, but these comprise a sufficient sampling, and they make the situation clear. The typical book publisher, judging from this experience, will allow as how he is on the side of the angels, but he is reluctant to bring forth books on that side because they don't make money. So let us put at least part of the blame for our present superstitious times

where it belongs—not at the doors of the skeptics (who are trying to educate the public), but at those of the publishers whose interests are elsewhere than in the dissemination of an open-minded and fair-minded skeptical approach to some puzzling, even dangerous, beliefs of our time.

I would add that when *Close Encounters* approached I wrote to Doubleday suggesting this would be a good time to run an ad or two for *Enigma*, thus capitalizing on the current interest in UFOs and at the same time exposing the public to a view different from the one espoused in the film. So far as I know, no such ad appeared. Indeed, Doubleday did not answer my letter. I don't know if Philip Klass similarly importuned Random House with respect to his books, but I have seen no ads for those either.

I hope this communication will not be interpreted as an expression of personal pique, because the questions raised go beyond whether Doubleday will advertise *Enigma*, or why editors, assertedly sympathetic with the rational/skeptical point of view, decline to accept a proposal for a new book on the side of rational skepticism. And the questions go, as well, beyond book publishing and into other media, particularly television.

The "believer" point of view is the one that gets exposure, is published, is presented on the tube, sells, and makes money for the entrepreneur. The voice of reason gets short shrift and is not easily heard, or even found, except by those willing to make an effort. I suggest that this is a serious and potentially dangerous condition and that those who govern the policies of the communications media should reassess their responsibilities. The tendency for the media to live by the balance sheet is pernicious, it is dangerous, and it must be challenged and combatted.

Ernest H. Taves, M.D.
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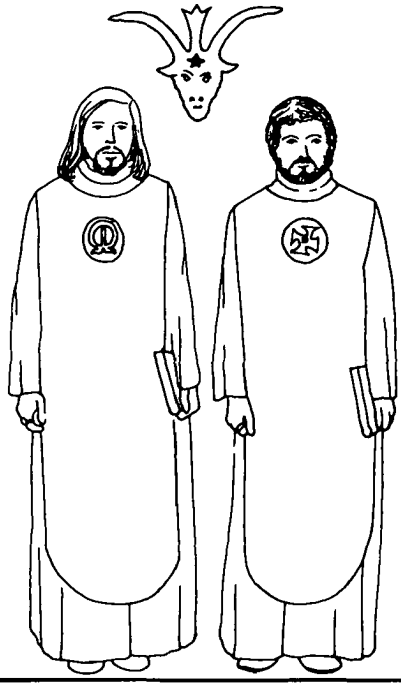

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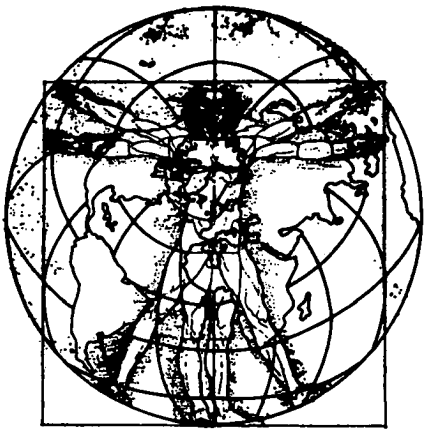

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